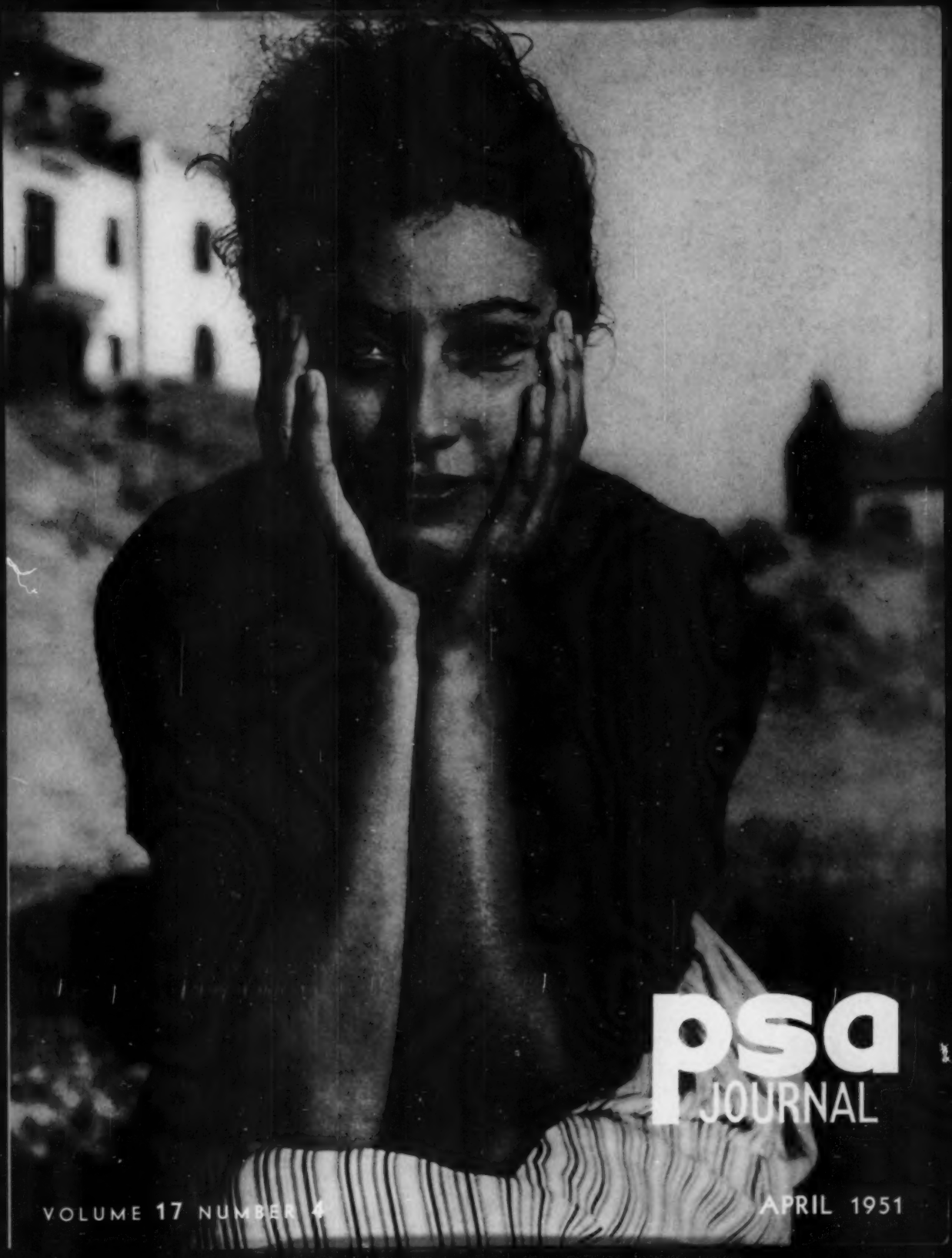

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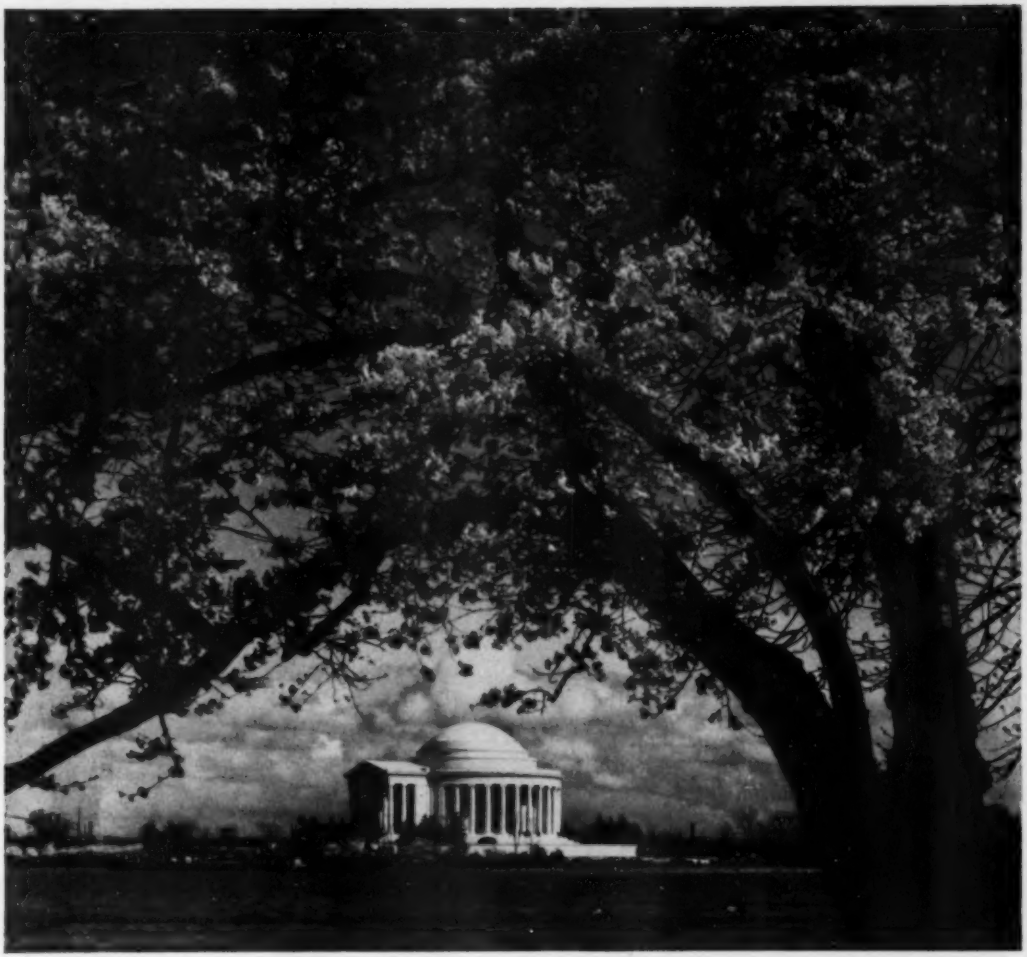

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Volume 17, No. 4, April 1951. Issued Monthly to Members. Price to Non-Members $10.00 per Year.

THIS SPECIAL ISSUE OF PSA JOURNAL IS PUBLISHED IN TWO SECTIONS

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PUBLICATION OFFICE: 374 Broadway, Albany 7, New York

EDITORIAL AND ADVERTISING OFFICE: Kutztown, Pennsylvania

Entered as second-class matter September 9, 1941, at the post office at Albany, New York, under the Act of March 3, 1879.

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TECHNIQUES . . .

IF THERE be those who need convincing of the work of photographic organizations like PSA, they will find dramatic proof in the series of articles on relationships between gray scale, exposure, development, and print quality written by David Darvas, APSA, and published in recent issues of PSA JOURNAL.

NOT so long ago photographers were wrestling with what they thought to be individual problems of exposure and development. They learned from mistakes, experience, and occasional meetings with their seniors. By and large, each has his own "secret" method which he was loath to disclose.

WITHIN A few years the technique of exposing and developing for concrete results has been explained to the point where even the lay mind has acquired broad, practical understanding of the subject. Perhaps this period of enlightenment may be said to have started with John Davenport's articles, published in early "U. S. Camera," recommending multiple evaluations of scene brightness range, and related development thereafter. More recently Ansel Adams, FPSA, has been expounding basic phases of the same technique in a series of practical tomes. "Photo Lab Index" has contributed greatly by assembling and presenting technical data, including essential time-temperature tables. There have been many contributions by others, too, including no little laboratory work. Now David Darvas brings the technique into the humblest darkroom by establishing and visualizing the relationships between gray scale, negative densities, development, and the kind of print the photographer wants.

PERHAPS MUCH of this helpful information eventually would have achieved circulation in any event. The fact remains that the process of distribution has been accelerated and expanded by cooperative effort. . . . VHS

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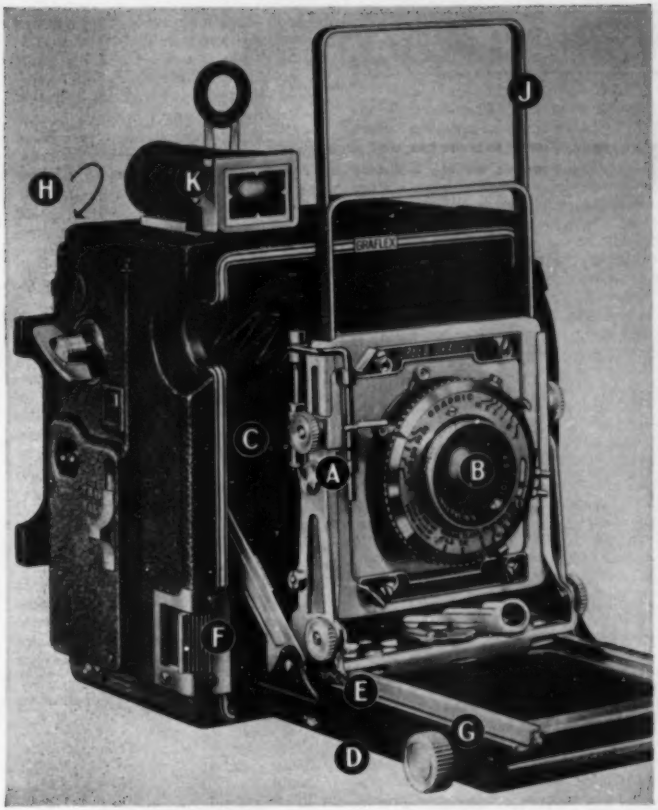
Detroit, Michigan, October 10–13, 1951



A. CONTORTIONIST FRONT. For corrected perspective whenever you want it, you'll like the movable front of your Graphic camera. Simple, positive controls let you raise or lower the lens, shift it from side to side, or tilt it to correct focus and to increase depth of field. Great for architectural, scenic, table-top work, and many other subjects.

B. INTERCHANGEABLE LENSES. An important feature of all Graphic cameras is the speed and ease with which lenses can be switched. A quick flip of the slide locks, and your lens board is removed and ready to be replaced with one of the fine portrait, wide-angle, telephoto, or other special purpose lenses. For the best picture every time you'll want the right lens, and Graphic makes it easy to switch them!

C. DOUBLE EXTENSION BELLOWS. For extreme close-up work, your Graphic camera has a bellows which extends to more than double the focal length of the standard lens! With bellows extended the standard lens can give a full-sized copy! Of course, special lenses may also need the added usefulness of the double extension bellows. A fine feature.

D. DROP BED. As an aid in correcting perspective in conjunction with the tilting lens board, and for use with wide-angle lenses, your Graphic has a camera bed which drops down and locks firmly while retaining the link between the track and focusing knobs. It's a small detail, but there are times when it makes the difference between a fine picture and a failure. You'll get that fine picture with your Graphic!

E. FOLDING INFINITY STOPS. You'll find two set stops on the bed tracks, that bring the camera front into exact calibration with the Vernier focusing scale, and squared with the film plane, where it is secured with the locking lever. These stops fold back to allow the camera front to move farther forward when needed. You can have as many as three sets of stops installed to give quick calibration with different lenses. A useful, original feature!

F. BODY SHUTTER RELEASE. For extra stability when the Graphic is hand-held, you'll find a shutter release set into the right hand corner of the camera body. It gives you solid support for the camera at the instant of exposure . . . another well-planned Graphic detail. The Speed Graphic provides, in addition, a selector control which gives instant choice of front or rear shutter from the same release.

MULTIPLE FOCUSING CHOICE. For viewing the picture field and for razor-sharp Graphic focus, these fine cameras offer a real choice. G. There's the accurate Vernier type focusing scale on the camera bed . . . H. the ground glass focus through the lens . . . J. the folding open frame viewfinder with parallax correction . . . K. the tubular optical viewfinder with parallax correction (optional on the Century Graphic) . . . and the coupled Kalart rangefinder (optional). Use any one, or use them together as extra checks . . . you can't miss with a Graphic.

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FROM ANY ANGLE . . . IT'S THE GRAPHIC! You must see the Graphic cameras, and use them, to fully appreciate their many advantages. Although loaded with the many features, the great choice of focus, viewfinding, shutter release, film types, and other elements that make for versatility, the Graphic camera is built for easy operation. That's why America's press cameramen use and prefer them, find them ideal for quick, sure, simple operation that cuts adjustments and "fiddling" to a minimum. You can use it like an ordinary folding camera, with excellent results. But the added features are there when you need them!

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THE PICA RULE

This issue of PSA JOURNAL marks the beginning of a series of special numbers, each devoted to some phase of photography.

This month we are including a 32-page section featuring photo-journalism and press photography, beginning on page 175. It contains a dozen articles by the outstanding writers in their fields. It makes one of the most interesting and instructive features ever presented in PSA JOURNAL.

A great deal of work has gone into this issue and grateful acknowledgement is made to Cliff Edom, without whose efforts it would have been impossible. Our thanks are also extended to Joe Costa and "The Complete Book of Press Photography" for many of the illustrations and to Bob Garland for invaluable assistance.

Speaking of press photography brings to mind the excellent job the National Press Photographers Association is doing in the photographic field. This worthy organization deserves the support of every PSA member, and, after reading Ken McLaughlin's article on page 201, if you wish to join, drop me a card and an application form will be forwarded promptly.

Another organization which deserves every bit of help they can get is the Volunteer Service Photographers (292 Madison Ave., New York 17, N. Y.). Joe Costa recently donated a color photograph of Pope Pius XII and Francis Cardinal Spellman to them. The VSP in turn sold it to Isadore Marks, president of Keystone Mfg. Co. of Boston, for $3,000, the proceeds being used for rehabilitation photography in veterans hospitals.

The recent Tenth Annual Short Course in Photography, held at Kent State University March 20–23rd, featured Yousuf Karsh, FPSA, and a number of PSA members. Incidentally, Karsh will be one of the feature speakers at the P.A. of A. Convention, July 4–8th, Waldorf-Astoria Hotel, New York City. This year the P.A. of A. is inviting all PSA members to attend their convention and trade show and details will be published next month.

Coming Issues

In May we will present a special feature devoted to nature photography. Among the articles will be one on the discovery of the Great Ungava Crater by Robert C. Hermes; "Wild Animals in the Home" by Harry Reich; "Documenting the Nature Story" by H. Lou Gibson; "How to Photograph Sand Dunes" by Johnny Appleseed; "Operation Sea Gull" by David Stanley; "Insect Photography" by Lee Jenkins; "Plant Your Pictures in Advance" by Boris Dobro, etc.

In addition the May issue will contain the PSA Directory, an alphabetical listing of all members, with their addresses, year of joining the Society, and Divisional affiliations. In order to correct PSA records, it is urgently requested that all members check the spelling of their names, their address, and their Division as soon as the May issue is received. If any errors are noted, PSA Headquarters in Philadelphia should be notified immediately so that the stencils may be corrected.

Incidentally, due to the tremendous amount of work required on the Directory, the May JOURNAL will not be mailed from Albany until the end of May.

The June JOURNAL will contain a special 32-page feature devoted to pictorialism. Articles already received indicate that it will be an issue that no serious pictorialist or camera club member can afford to miss.

Division Affiliation

Just how valuable are the Divisions to PSA? They were established in recognition of the fact that there are many fields of interest in photography and these fields could be better serviced by those specializing in that particular branch. A great many of the services PSA has to offer are obtainable through the Divisions.

And yet, in making up the May Directory, we were amazed to learn that 1393 PSA members—22.5% of the total—were not affiliated with any Division. To those in the U. S. and Canada, membership in any one Division is free. The Divisions should contact those who have not affiliated and point out that they are not taking advantage of the services to which they are rightfully entitled.

As of April 1st, the number of members in each Division was as follows:

Color	1651	26.6%
Motion Picture	359	5.8%
Nature	344	5.6%
Photo-Journalism	458	7.4%
Pictorial	2642	42.8%
Technical	643	10.4%
None	1393	22.5%

These figures are based on a total membership of 6191, and percentages indicate how many of the entire membership of the Society are enrolled in that Division. It should be borne in mind that some members are affiliated with more than one Division.

Dealers Convention

The annual convention and trade show of the Master Photo Dealers' & Finishers' Association was held in Atlantic City the middle of March. Several new products were shown including a Polaroid film for turning out finished lantern slides in 60 seconds and a desk-top copymaker. Increased interest in stereo was evident.

One of the speakers recommended that a campaign be started to have a picture included in every letter written. The idea, while not new, is excellent and would do a great deal to promote photography. Some pictorialists always include a contact print in the letters they write me, and I can assure you those letters are eagerly awaited. Why not try it?

FRED QUELLMALZ, JR., Hon. PSA

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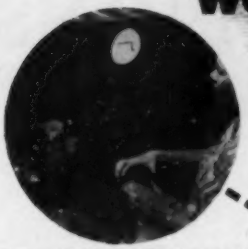
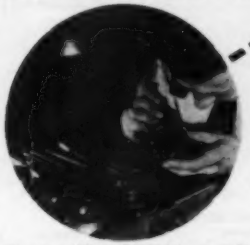


Contact quality (bounce) check on Oscillograph

Checking shutter speeds, synchronization and duration of contact with Interval Meter



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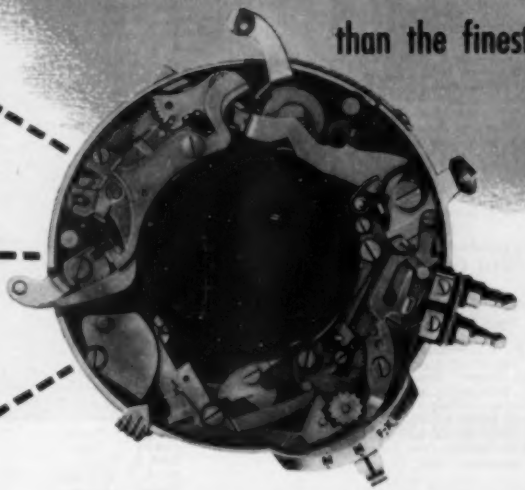

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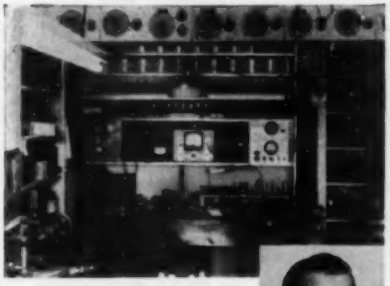

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Award Winners

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Boris Dobro, Santa Barbara, California
Larry D. Hanson, Minneapolis, Minnesota
Dr. G. Thomas, Bangalore, India
Philip Cass, Philadelphia, Pennsylvania
Dr. Ernest To, Hong Kong
Robert McFerran, Ft. Wayne, Indiana
Harold A. Larsen, Hamilton, New Zeland
Hoyt L. Roush, Charlotte, North Carolina
Sam Vogan, Toronto, Canada
Dr. M. L. Kuhs, Green Bay, Wisconsin
Lee A. Ellis, Waban, Massachusetts
James Riddick, Chicago, Illinois
Harold W. T. Purnell, Georgetown, Dela.

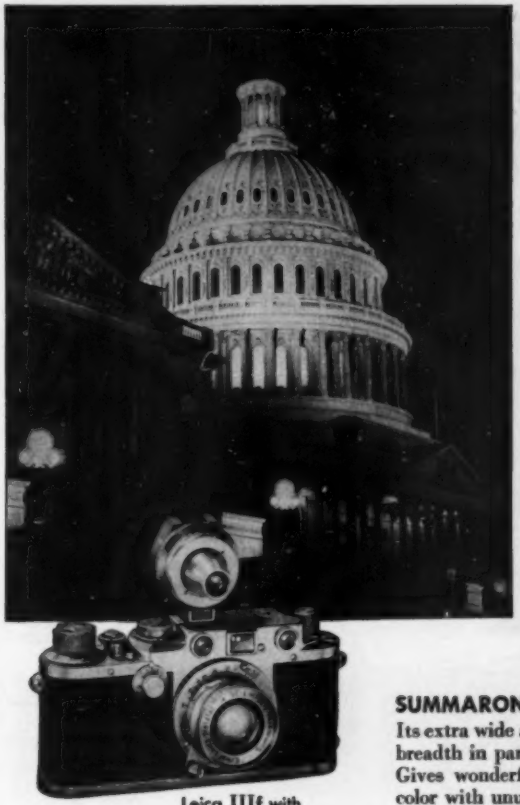
The following members won print awards in the January 1951 Drive of Champions contest:

K. M. Banerji, Nagpur, India
Frank J. Delima, Caracas, Venezuela
Walter E. Parker, Chicago, Illinois
Fred Quellmalz, Jr., Kutztown, Penn.
J. E. Armstrong, Detroit, Michigan
Dr. L. L. Handly, Houston, Texas
Larry D. Hanson, Minneapolis, Minn.
H. J. Johnson, Chicago, Illinois
Charles A. Kinsley, Rochester, New York
Harold A. Larsen, Hamilton, New Zealand
H. D. Sheldon, West Caldwell, New Jersey
Dr. G. Thomas, Bangalore, India

Drive of Champions Tally

As of March 15, 1951

State	*Name*	*Points*
District No. 1		
Maine	Augusta Camera Club	1
New Hampshire	Benjamin Thomas	1
Vermont	None	0
Massachusetts	Cecil B. Atwater	2
	Rudolph C. Born	1
	Albert L. Brooks	1
	Lee A. Ellis	5*
	Mrs. Ira L. Goding	1
	Clark W. Goodchild	2
	Capt. W. H. Greenhalgh, Jr.	2
	Ralph A. Hammann	1
	Hutson K. Howell	3
	Franklin I. Jordan	1
	Raoul A. Munn	1
	Mrs. Barbara Standish	1
Connecticut	Edward Hutchinson	1
	Raymond J. LeBlanc	1
	Hy Schwartz	½
	Paul A. Sperry	20*
Rhode Island	None	0
District No. 2		
New York	Bernard M. Acosta	14*
	Paul Arnold	2
	Perry Atkinson	1
	Edward L. Bailey	1
	B. Erle Buckley	2
	Willard H. Carr	½
	T. Anthony Caruso	2
	Earl R. Clark	1
	Charles H. Coppard	1
	R. M. Corbin	½
	John H. Densauer	1
	William J. Dewhirst	7*
	Catherine E. Dorr	1
	Thomas W. Drew	1
	George Eaton	3
	Robert F. Edgerton	2
	David B. Eisendrath, Jr.	1
	Mrs. Franke Fassbender	11*
	Howard E. Foote	2
	W. R. Franklin	1
	Norris Harkness	1
	Richard W. Henn	1
	William R. Hutchinson	2
	Charles A. Kinsley	2
	Paul J. Koehler	2
	Dr. Bernhard Landau	4
	Daniel J. Lawrence	2
	Norman C. Lipton	1
	Rev. Boyd A. Little	9*
	John H. Magee	41*
	Margo Studio	1
	R. B. Martenson	11*
	Hugo Maugeri	2
	Arthur S. Mawhinney	1
	Herbert McDonough	1
	Metropolitan CC Council	1
	Walter S. Meyers	1
	Lowell E. Muehler	1
	John G. Mulder	108*
	J. Stanley Nixon	2
	Frank Nolan	1
	H. Paschel	1
	Martin Polk	3
	H. C. Radon	1
	Harry R. Reich	3
	Norman Rothschild	1
	Ralph Samuels	1
	Walter Sarff	1
	E. G. Sargent	½
	V. H. Scales	2½
	Irving Schlackman	1
	Earle Schwartzott	1
	C. W. Seager	1
	Fenwick G. Small	1
	William F. Small	2
	Howard E. Smith	1
	Harold B. Spriggs	1
	W. F. Swann	1
	Silas M. Thronson	3
	Charles H. Tipple	1
	Ruth E. Tremor	1
	Dr. E. P. Wightman	20*
	Edward C. Wilson	2
	Paul J. Wolf	2
New Jersey	Roy J. Bohlen	1
	Henry M. Bosman	1
	H. R. Caler	1
	Russell E. Darby	1
	Howard C. Duncan	1
	J. Enoch Faw	1
	Louis Lehman	2
	James F. Monteverde	1
	George J. Munz	1
	Leonrad Ochtman, Jr.	1
	H. D. Sheldon	11½*
	Dennis A. Simonetti	2
	Carlyle F. Trevelyan	1
	John R. Weber	1
	W. L. Woodburn	1
District No. 3		
Pennsylvania	F. Ross Altwater	1
	R. S. Beese	1
	Rev. H. Bielenberg	2
	Harvey H. Boarts	1
	Wilson R. Browne	1
	P. J. Cancelmo	2
	Philip Cass	82**
	Hilda F. Hampfler	1
	Arlene H. Daniels	1
	Dr. Francis A. Faught	1
	G. A. Hampfler	1
	Nelson Hutchinson	5*
	George F. Johnson	3
	P. Kissinger	1
	Richard R. Koch	53½**
	Mrs. Janet Leathem	1
	S. Miller Mack	½
	Foster Moyer	4
	L. V. Platt	1
	F. Quellmalz, Jr.	102**
	O. E. Romig	2
	Jesse Weiss	1
	Paul J. Wolfe	3
	Asa L. Young	2
Delaware	E. T. Howell	1
	A. K. Pfister	1
	Harold W. T. Purnell	5½*
Maryland	Mrs. Caryl Firth	3
	Tom Firth	6*
	Alex G. Potamianos	1½
	W. G. Schepleng	1
	Oliver C. Shipley	1
	E. V. Wenzell	2
D. of Columbia	Mrs. Suzanne T. Cooper	1
	Mrs. Bettie Z. Fahnestock	1
	C. H. Severance	1
	Harry B. Shaw	1
Virginia	Capt. F. C. Allen	1
	Ollie Atkins	2
	William E. Booth	1
	Camera Club of Richmond	3
	Dr. J. O. Fitzgerald	1
	T. F. Holt	9*
	Old Dominion CC	1
	Charles C. Peterson	1
West Virginia	Mrs. Louise A. Geisel	1
District No. 4		
Ohio	A. Millard Armstrong	2
	Axel Bahnsen	2
	James A. Bines	½
	Frank E. Carlson	2
	Jack Clemmer	1
	R. C. Hakanson	2
	E. J. Hobbs	1
	Herbert M. Howison	1
	Miss Stella Jenks	1
	Charles M. Kyle	1
	J. Robert Langlotz	7*
	Edward B. Noel	4
	A. L. Paschall	1
	P. H. Oelman	2
	Albert M. Simpson	1
	Miss Sidney Thomas	4
	Doris M. Weber	41*
	J. G. Whetson	2
Indiana	Mrs. Irma G. Haselwood	1
	Mrs. Frank Hoke	1
	Robert L. McFerran	6*
	Harvey P. Rockwell	1
Kentucky	French Patterson	1
	E. G. Zanone	1
Michigan	Roland N. Anderson	1
	J. Elwood Armstrong	13*
	Isadore A. Berger	½
	Earle W. Brown	10½*
	Lyall F. Cross	3
	Mrs. Jean Elwell	1
	Audrey Gingrich	3
	Belle McMillen	4
	R. H. Nichols	1
	Mrs. Constance L. Phelps	1
	Harry Perry	3
District No. 5		
Tennessee	Miss Eugenia Buxton	6*
	Lester D. Cohn	1
	Thomas F. Gaines	1
	Herbert Jackson	23*
	Allison V. Slagle	3
Georgia	C. F. Luce, Jr.	3
Florida	C. Verne Klintworth	3
Alabama	H. Jack Jones	3
	Prescott V. Kelley	4½
Mississippi	J. M. Endres	3
North Carolina	Melvin F. Cipar	2
	William A. Ramsey	1
	Hoyt L. Roush	5*
South Carolina	Hugh F. Walburn	2
District No. 6		
Louisiana	Vance J. Rhodes	1
	Wood Whitesell	12*
	A. E. Woolley, Jr.	2
Arkansas	Allan M. Thomas	1
Missouri	Stuart M. Chambers	61**
	W. E. Chase	4
	B. E. Emerson	1
	Martin B. Manovill	1
	Alfred S. Norbury	3
Kansas	Dr. H. E. Morgan	1
	C. R. Romstedt	1
	Dan B. Rumpf	3
Texas	Samuel F. Davis	2
	Eugene C. Doehne	1
	Paul L. Gittings	2
	Ralph E. Gray	2½
	Lloyd L. Gregory	3
	Dr. L. L. Handly	4
	C. J. Perry	5*
	W. F. Reeves	1
	Carlos Sandoval	1
	F. J. Schmidt	½
	CWO Frank I. Yates	9*
Oklahoma	G. E. Fiellin	3
	Frank J. Heller	3
	John Long	1



CAPITOL NIGHT

. . . Leica photo by Julius Huisgen, New York City; taken in Washington, D. C. with Summaron 35mm. lens at f/5.6; 30 second exposure.

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State	*Name*	*Points*
District No. 7		
North Dakota	None	0
South Dakota	E. C. Lugg	1
	E. V. Wilcox	1
Nebraska	Sten T. Anderson	4
	Richard C. Knott	1
	Stanley D. Sohl	5*
	Mrs. Virginia Spearman	1
Illinois	Rus Arnold	4
	Fgon Berka	1
	George W. Blaha	1
	Dwight M. Chambers	4
	Mrs. Evelyn Chambers	3
	Dr. Edward Chips	5*
	Eldridge R. Christhilf	4
	Dr. C. F. Cochran	3
	Clifford B. Cox	1
	Glenn E. Dahlby	1
	Miss Miriam Davey	2
	C. G. Einhaus	2
	Frank Fenner, Jr.	1
	Mrs. C. L. Fredrick	4½
	W. Howard Fredrick	3
	Frank E. Fuller	1
	Roderick C. Fullerton	1
	Americo Grasso	1
	Russel D. Haines	1
	Fred A. Helm	1
	Lionel Heymann	2
	A. E. Hjerpe	1
	Betty Henderson Hulett	1
	H. J. Johnson	13½*
	Robert M. Keith	1
	Mrs. Blanche Kolarik	4
	Monte Kople	1
	Russell Kriete	1
	Lou H. Leff	1
	Warren W. Lewis	2
	Mary Matsumara	1
	Jean Mowat	½
	Walter E. Parker	29*
	Klem Petrosius	1
	D. A. Pritchard	3
	F. Purrington	2
	Lewis T. Reed	2
	James Riddick	2
	Evelyn M. Robbins	2
	J. H. Sammis	1
	Clara Schmitt	1
	Pearl E. Schwartz	2
	Frederick T. Sharp	1
	J. P. Wahlman	1
	Rennie L. Weber	2
	Edwin B. Whitcomb	1
	S. P. Wright	2
	Mabel Young	4
Iowa	Edith M. Royky	6*
	Mrs. John J. Strandberg	1
	Waterloo Camera Club	1
Minnesota	Larry D. Hanson	31*
	V. P. Hollis	1
	Conn H. Irber	1
	Vim M. Judd	1
	Roy E. Lindahl	1
	John H. Wilke	1
Wisconsin	Clifford Beal	1
	E. A. Byrsdorfer	1
	Alan J. Dale	1
	Dr. Milton L. Kuhs	3
	Ted Laatsch	1
	Robert J. Lauer	5*
	Ray Miess	23*
	V. E. Shimanski	20*
District No. 8		
Washington	A. M. Kendrick	4
	Joe Marshall	5*
Oregon	Hal Carver	1
	Lafie L. Foster	2
	C. W. Getzendaner	4
Montana	Camera Club of Bozeman	2
	Carlton L. Lingwall	6*
	Frank R. Rademaker	1
Idaho	None	0
Wyoming	Dick Harris	1
District No. 9		
California	Dr. Werner Alexewitz	1
	A. Appelman	1
	K. V. Arntzen	3
	Esmond Arthur	1
	J. Philip Bambara	2
	John F. Barnes	1
	Karl A. Baumgaertel	1
	E. W. Blew	10*
	Harvey W. Brown	14*
	Clyde L. Browning	1
	W. W. Callow	1
	Harold M. Child	2
	Moreland M. Dearderick	7*
	Boris Dolgo	45*
	Milton Efron	1
	Merle S. Ewell	2
	Frank R. Farbone	1
	Donald B. Finch	1
	John Forsythe, Jr.	1
	Harold Girton	3
	Clifton L. Hagenbuch	2
	Max J. Harn	1
	Vincent H. Hunter	1
	C. B. Jowett	1
	John B. Mengel	4½
	Clyde A. Pruzman	1
	Bernard G. Purves	1
	Frederick L. Richards	1
	A. E. Soderberg	1
	Max Sorensen	2
	So. Cal. Council of CC	4
	So. Cal. Sec. TD	1
	Carl Terhune	1
	Harold L. Thompson	1
	H. A. Thornhill	4
	Wilber H. Wier	1
	Charles L. Wilson	4
Nevada	None	0
Utah	Dr. S. Wayne Smith	1
Colorado	Dr. Max Glesecke	1
	Roy E. Petersen	1
	Stuart Shaw	1
New Mexico	Henry C. Kyllingstad	1
Arizona	Bruce Cole	1
	Leslie J. Mahoney	2
District No. 10		
Alaska	Richard Chace	1
	Gilbert G. Whitehead	2
Hawaii	Frederick F. D. Chu	1
	Gilbert H. C. Lum	4
	David A. Muramoto	7*
	National Photo CC	6*
	Hy Seldidge	3
	H. A. Touhy	6*
Puerto Rico	William C. Ehlefeld	½
Canal Zone	None	0
Area 1		
Canada	William B. Bate	½
	Cinq-Mars Benoit	½
	Raymond Caron	1½
	Dr. M. A. Chantler	½
	Stanley C. Dakin	½
	George Fearnley	½
	J. W. Galloway	½
	George G. Hirt	½
	James A. McVie	6*
	New Westminster CC	½
	Cyril F. Smith	½
	Oliver W. R. Smith	5½*
	Sam J. Vogan	9*
	Harry L. Waddle	1
	Walter F. Wood	1
Area 2		
Brazil	Jose Rastelli	1½
Chile	Rudy Hirsch	½
Costa Rica	Dr. Esteban A. DeVarona	13*
Cuba	Angel DeMoya	14½*
	F. Figueredo	1½
	Jorge Figueroa	½
Mexico	Gordon C. Abbott	1
	A. W. Gelbke	2
Venezuela	Frank J. Delima	5½*
Area 3		
England	Dr. Peter Hansel	½
	Arnold Kidson	½
Area 4		
Australia	Max Walton	½
Hong Kong	Dr. Ernest To	10*
	Francis Wu	2
India	K. M. Banerji	9*
	C. N. Chambers	½
	S. V. Gopal Row	½
	Dr. G. Thomas	6*
Guam	Albert Paul	½
New Zealand	F. Lennard Casbolt	½
	Harold A. Larsen	8½*
	Maj. Keith R. Mosheim	½
PSA Journal		3

LETTER TO THE EDITOR

Annapolis, Md.

TO THE EDITOR:

It should be easy enough for any eager-beaver PSAers to find out who this Johnny Appleseed is; here's a picture of his place of business located right on the main highway that runs up through Vermont to Canada. It would seem that all one would have to do would be to write to some PSA member or to one of the camera club affiliates of PSA in or near Rutland or Burlington and request full identity of the elusive and mysterious character.

You might know that this Appleseed fellow would be mixed up with some such literary undertaking as a bookshop or a library or a publication of some sort, because he certainly can trail a pretty participle when he feels so inclined in his excellent articles in the JOURNAL.

I've meant to send this shot to you ever since last summer when Eddie Bafford ("Bromoil Eddie" to you since the Baltimore Convention) and I made a photographic trip to Quebec and Montreal. While Eddie priced every item in the antique shop which is next door to the Appleseed store and didn't buy a thing — not even a postcard to pay the exasperated antique dealer for her time in showing him every item in her collection — I strolled across the lawn which separates the two establishments and made this shot for PSA members interested in Appleseed's identity.

The fellow who owns this shop and the

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Photo: Strobe shot by Charles Hoff, N. Y. News

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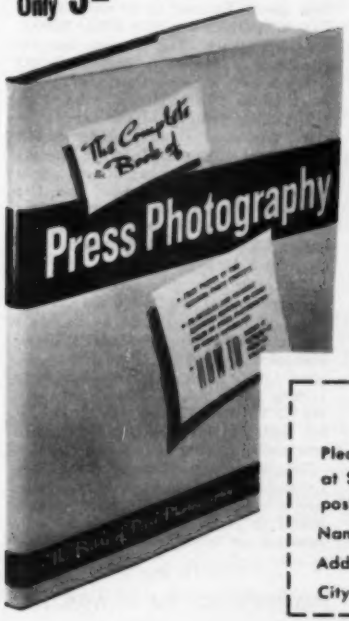

Published by the NPPA to help working news camera men improve their pictures—aid ambitious amateurs and photojournalism students to break in—help the professions that use news photos—and bring the public up to date on today's amazing feats in news-picture transmission—through such articles as *How the Wirephoto Network Operates; News on Television; The Newsreel; Picture Collection and Distribution in Post War Europe; etc.*

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fellow who writes such interesting articles for PSA JOURNAL must be one and the same, because he wrote about a trip he had made through Maine (right up there practically in his own back yard) and it was so well done and his locations were so well described that it seemed as though he had followed Eddie and me the summer before last when we made the same trip and had stood in our footprints to take the shots we made.

One thing he did miss, however, was those old beached derelicts just down the river from the bridge at Wiscasset. We crawled all around those things — we can show him those derelicts at dawn, high noon, sunset — in foggy weather and under cloud-dappled skies. And if he wants to search in the oozy mud under that rickety, rotten trestle just und / the bows of those ships, I can tell hir where he'll find my sunshade and favorite orange filter which fell off my lens while I was making like a monkey to get an unusual angle shot of that impressive sight.

CHARLES E. EMERY, APSA

Johnny Appleseed's Place of Business

New Aids for Better Picture-Making

JACOB DESCHIN, APSA

Way back in the fall of 1948 the Haloid Company made a stir in the photographic firmament by announcing a new kind of photography, by electricity, which they called Xerography. The research and design by this company's men and the Battelle Memorial Institute, research center at Columbus, Ohio, has now borne fruit with the annnouncement by the Signal Corps Engineering Laboratories at Fort Monmouth, that the first practical camera to use the process has been perfected.

The process, which produces photographic images by means of electricity, is based on the recording of light reflections on a selenium-coated metal plate which has been previously sensitized by an electrical charge. The production model of the camera has been named the "Two-Minute Minnie" because it produces a finished 4x5-inch picture within two minutes after the shutter has been snapped. Although the camera will be made for the Army and will not be available for general use, it is good to know that something has finally materialized from the exciting Haloid disclosure of two years ago. And there is always the possibility that in time, Xerography will also be at the disposal of the man in the street.

In the Xerography process both sensitizing and processing are done inside the camera, thus eliminating the darkroom. The camera uses an ordinary lens and shutter, takes pictures by normal sources of illumination on film having the speed of average orthochromatic emulsion. The picture has tones similar to those of an ordinary black-and-white photograph, can be printed on paper, wood, cloth, glass, plastic or ceramics, and can be re-used several hundred times merely by wiping off the image and re-sensitizing the plate.

After exposure, the resulting electrical image on the plate is dusted with finely ground charcoal or anthracite coal powder, which sticks to the plate in proportion to the amount of electricity with which it has been charged during exposure. Printing is then done by transferring this powdered image to paper or other material coated with an adhesive layer, such as rubber cement. The print is then protected by covering it with a clear transparent plastic film pressed against the picture.

The first American camera designed to photograph the interior of the eye for record, diagnosis and teaching was introduced in New York City during a symposium on eye photography at a meeting of the New York chapter of the Biological Photographic Association, Inc. Manufactured by Bausch & Lomb Company, Rochester, the new retinal camera was demonstrated by Howard Trimby, director of the company's Ophthalmic Division, who emphasized the camera's simplicity of operation, its highly concentrated and uniform arc-source illumination, and the fact that exposures on Kodachrome can be made at 1/25th of a second and the small lens aperture of f/28. The pictures are recorded on Kodachrome Bantam-size film in a modified miniature camera back.

The first attempts to photograph the retina were made in America as early as 1862, said Miss Margaret Markham, eye photography instructor at the New York University Post-Graduate Medical School, who conducted the meeting. Because of its unique construction and operating convenience, the new camera "will help the inexperienced technician to get a greater number of average good pictures" than has been hitherto possible, said Miss Markham. Until now only the German-made Zeiss-Nordenson Retinal Camera has been available.

A new importing company, Saul Bower, Inc., of 114 Liberty Street, New York City, makes its bow in the photographic fraternity with a neat little item called the Bower-X, a 620 rollfilm bellows-type camera in the $30-to-$50 range, a much-neglected price area. The camera is imported from the United States Zone in Germany by Saul Bower, an old-timer in this field.

The Bower-X takes eight 2¼x3¼-inch pictures or, masked down, sixteen 1⅝x2¼ inch. Equipped with the 10.5cm Schneider Radionar f/4.5 coated lens, the camera is sold with the Vario shutter, with speeds 1/25th to 1/200th, at $34.50; with the Prontor S shutter, 1 second to 1/250th and built-in self-timer, at $43. Both models have built-in flash synchronization. Features include body shutter release, waist-level brilliant and eye-level open-frame sports finders, film pressure plate, hinged back, genuine leather bellows, compactness and 24-ounce weight.

The Bolsey 35 has added to its versatility in a Bolsey B-Special model, which is designed with a removable shutter-lens assembly for close-up photography. With three extension rings between lens and camera, photographs may be taken as close as 3¼ inches from lens to subject and covering an area of 1¼x1½ inches. Without extension rings, the closest focusing distance is two feet. Supplied with one extension ring, the Bolsey B-Special is $71.25. Additional rings are $5 each. Charts are supplied for working at various distances with different ring combinations and with supplementary lenses. For details, write the Bolsey Corporation of America, Inc., 118 East Twenty-fifth Street, New York, N. Y., and mention PSA JOURNAL.

Four cameras, one of them a movie, have been recently imported by the active Ercona Camera Corporation, 527 Fifth Avenue, New York City. The company has reintroduced the Master Reflex, formerly the Reflex Korelle, a German-made single-lens reflex taking twelve 2¼x2¼ pictures on 120 rollfilm. Features of this camera include focal-plane shutter speeds from 1 second to 1/1000th; built-in synchronization for flash and strobe; delayed action timer; combined shutter wind and film transport; double exposure prevention; sports finder in hood; interchangeable lenses. With coated f/2.8 Zeiss Tessar lens, the price is $199.50.

The other two stills are the German 35mm miniatures, the Iloca I and Iloca II. The first has a coated f/3.5 anastigmat lens; a flash-synchronized Vario II shutter with speeds to 1/200th, all-metal body, and costs $39.95; with Prontor-S shutter to 1/300th and delayed-action self-timer, $49.95. The Iloca II, similar to the Iloca I, but with coupled rangefinder, Prontor-S synchronized shutter and self-timer, is $75.

The movie camera is the 8mm Nizo, German-made. Among its features is a double-lens mount on a slide which is shifted up or down for interchange of a standard and a telephoto lens. When the

(Turn to page 219)

"How To"

No. 15—PHOTOGRAPH FLOWERS

JOHNNY APPLESEED, APSA

WHEN you get temporarily tired of kids that jump out of focus, pets that skip out, models that walk out, landscapes that cloud out, still-lifes that are better out, try photographing flowers. They only wilt out of the picture, unless you know some of the tricks. And that's what this session is about.

Flowers offer a varied selection of subjects and numerous treatments, and almost any photographic equipment lends itself to some type of flower record. Even the fixed-focus roll-film camera can be used for picturing flowering sprays, bushes or trees. Then, if you add supplementary lenses and focal frames to these cameras, close-ups of large flowers or groups of small ones are feasible. For extreme close-ups and for convenient focusing and composing, the small view-type camera provides most versatility. Let's discuss equipment for a while.

Since the miniature color slide is the most popular type of record for pictorial and nature salons, a miniature roll-film camera or a larger one fitted with adapters for miniature film will be the most generally adopted equipment. And it is well worthwhile to build or procure a focal frame so that close-ups can be included in the flower-photography program.

Focal frames and supplementary lenses take over where the view finder and camera lens leave off. Instructions for improvising focal frames can be obtained from the manufacturers of supplementary lenses. Essentially, they are wire or rod rectangles at the right distance from the lens to indicate the focus and of dimensions that outline the field—with a safety margin of about ¼ inch. Such a frame is pictured on page 499 of the September 1950 PSA JOURNAL.

The sizes of the focal frames and the powers of supplementary lenses will depend on the class of work intended. The 1+ lens will be needed if the camera does not focus down to 3½ feet. This will be useful for large plants or clusters. The 2+ lens permits an approach to 19½ inches at infinity focus and a field of 9⅜ x 14 inches with 35mm cameras. This provides a field quite adequate for many wild plants. Finally, for the close-ups, the use of both a 3+ and a 2+ allows the intimate views obtained at 6¾ inches at 4-feet focus with a 35mm field of 3¼ x 5 inches.

The user of a view camera will have complete versatility in focusing and composing. For color work, he may want to consider a miniature film adapter. Or he can plan on master sheet-film transparencies for 35mm duplication. A low tripod will be a very convenient support for outdoor work. A head that permits the entire camera to be moved back and forth is worth its weight in orchids. Other somewhat non-photographic items will be discussed in the following as various techniques are taken up.

Outdoor photography is probably the most common aspect, whether for pictorial or nature work, or for garden or wild flowers. In selecting a view point, the background should receive considerable attention. Spotty contrasts of sunlight and shadow, particularly dappled foliage, should be avoided whenever possible. Such a background area looks like dephlogisticated ectoplasm when out of focus. Very distant grass, rock, forest, or earth usually blends satisfactorily, even though fuzzy. And the sky provides an excellent background.

When spotty foliage is the only possible backdrop, the contrast can be reduced by casting the shadow of a coat over it. Or a piece of cheese cloth can be utilized for a softening effect. The latter expedient, of course, provides a lighter background than the former. A collapsible shovel is a handy device in the country, because with it many plants can be dug up and placed in front of a suitable backdrop. It is also valuable for bringing a plant out into sunlight. Always dig a large ball of earth so that the plant will live when replaced. Keep in mind that oversize divots like these are usually frowned upon by park attendants and garden owners!

Artificial backgrounds, like brown and sky-blue cards or roller window shades, offer another means for setting off the flowers. However, when they are used in sunlight, care must be taken to avoid shadows if a sky effect is to be simulated.

Sometimes there is not enough depth of field to encompass the entire plant or spray. The front flowers should be in focus. And then, if the rear ones cause an out-of-focus backdrop, they can be cut off. Care in this respect is required when the natural growth of the plant is to be

One of the most intriguing aspects of flower photography is that of showing the unsuspected beauty of common blossoms—like this close-up of catalpa blooms. The Kodachrome transparency from which this record was made shows delicate colors in what is usually thought from a distance to be an untidy mass of white flowers. Notice that the blossom with the greater cross lighting shows a deeper throat than the one into which the light (artificial) was more directly angled.

depicted. It is better to record at a reduced scale with adequate depth of field than to suggest an espalier habit with a round bush.

Sunlight offers an interesting play of light and shade over the flowers. But in order to avoid contrasty shadows, reflected fill-in illumination is needed to lighten the dark areas. White blotters mounted on cards or white cloth "flags" on two pointed sticks serve in this respect. One nature photographer effectively uses the bulge mirror from a bus to reflect diffuse sunlight into the shadows. A concave mirror is not suitable since it provides sharp illumination and leads to a hatchet lighting; it *is* handy in deep woods, however, for reflecting a patch of sunlight onto a plant in shade.

In general, a cross lighting is most suitable with regard to lighting angle. This is particularly true of trumpeted flowers because the depth of their throats is lost with front lighting. Back lighting often gives an ethereal motif to delicate flowers; it calls for efficient fill-in illumination from the front, nevertheless.

When clouds obscure the sun, the color quality of the light is likely to be on the blue side. The use of a skylight filter with color films is helpful to offset this somewhat. Also, nearby foliage should be removed from the vicinity of pale tinted flowers, or greenishness will be added to the blue effect. The latter effect can be pressed into service, however, when delicate blue flowers like gentian and chicory are being photographed. It is well known that they are difficult to record in color. The blue from the sky helps in maintaining their tint, so that even on sunny days they can often be advantageously photographed in shade.

The use of artificial light outdoors is valuable for photography in deep woods, or out in the open on dull days. Photoflash lamps in synchronizers or portable electronic flash units are entirely practical for the work. Exposure times and apertures can be such that daylight can be neglected. The suitable type of film for the lamps should be used. The effect looks somewhat artificial — like studying the flowers at night with a flashlight — but you at least get your flower. Don't try blooms that close at night this way, though.

Wind is the bugbear of flower photographers. There are several ways to minimize its effect, depending on the blow. Sometimes the shots can be obtained between gusts. Steady but moderate breezes can often be offset by propping the stems (outside the camera field) with twigs. A muslin cage supported by pointed sticks is a good item for the enthusiastic flower photographer. This can also serve as a reflector when the wind is coming from the shadow side. For covering all contingencies, the cage should be capable of encircling the plant, excepting a gap for the camera throw. Then an artificial background has to be placed inside the cage.

A good way to circumvent wind and to have other factors under control is to work indoors. This is particularly true when detailed studies of the blossoms or flower parts are to be made. If possible, the plant should be transplanted into some container so that the desired stage of florescence can be obtained. It should also be remembered that composition and freshness can be spoiled by drooping and wilting during the setup process. There is even the possibility of subject-motion during the exposure. Thus, potting the plant is useful from this standpoint too.

When the flowers are to be photographed cut, then they must be placed in water. Wads of cotton packed around the stems at the neck of the container offer a means for propping the flowers at the correct angle. They should be photographed as soon after cutting as possible, although some opening of the flowers can be allowed for.

The lighting indoors should simulate sunlight as closely as possible. Therefore, a single key light should first be directed at the most advantageous angle. Remember not to ram the light down the throats of trumpeted flowers. The key light should be raw to maintain texture. Thus a spotlight would be extremely valuable. Failing this, a bare lamp is preferable to one in a reflector.

The shadows should then be filled in at about "portraiture" intensity — a 2 to 1 ratio for color films, and 3 or 4 to 1 for black-and-white work, depending on the drama desired. This can be done with diffusion blotters or with a lamp in a reflector covered with a diffuser.

These two main lights are all that are needed for the general effect. Sometimes a back light serves to edge the flowers against a dark background. It is also advisable to have a few small pocket mirrors on hand for reflecting spots of light into dark areas missed by the main lamps. The mirrors can be supported and directed by pushing them into lumps of modeling clay. The usual precautions regarding light reflected from colored walls and other surroundings should be taken in color photography.

Flower photography will be found an absorbing and worthwhile phase of photography. There is always room for interesting flower studies in pictorial collections and salons. And nature salons are growing in number and support, so that there is outlet here too.

In the pictorial salon, artistic beauty, whether natural or formal, is the aim. In nature salons the competition is keen and voluminous in the flower class, so that the mistaken idea of "any old shot as long as it's a flower and not good enough for a pictorial salon" should be avoided. Pictorial and technical excellence is demanded in nature salons too. The emphasis should be on the characteristics and details of the flowers. Formal arrangements seldom get by in a nature salon; nevertheless, there is no ban on garden flowers au natural. Obviously (but don't laugh, it sometimes happens) a simulated outdoor shot should not have the neck of the milk-bottle or other water container showing. Always try to arrange a simple but pleasing composition for flower photographs as such. And, by the way, just to help the Hooper Rating of this little feature, try a few apple blossoms, won't you?

How do you photograph flowers? Why not drop me a line and disclose your own pet techniques? My address is PSA Headquarters, 2005 Walnut Street, Philadelphia. Best comments will be printed as space permits.

Next month: How To Photograph Sand Dunes

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DEAR JOHNNY:

In many years of reading many photographic publications I have yet to find anything to match your "How To" articles for genuine helpfulness. I read all of them, filed and indexed for ready reference and those on contrast control I've used to good advantage.

Thanks a lot.

F. S. DAUWALTER

Three Useful Movie Gadgets

RALPH V. WILSON

GENERALLY speaking, photographic equipment, as turned out by the manufacturer, is quite satisfactory. Occasionally, however, a user may find it necessary to make supplemental additions, consisting of small gadgets, in order to adapt his camera so that it may create a desired effect. Such was the situation, in the instance of the writer, who in an attempt to obtain steadier pictures and create more artistic fades, attained this objective by the use of such simple devices as those outlined in this article. They consist of a cable release for a Sportster type model, which one may find of some assistance in counteracting any effect caused by hand tremor; a fading device; and, still another fading device, adaptable to either the Sportster type or turret models of many movie cameras.

Cable Release

This device consists of two separate parts, joined together, a bracket and release cable. The cable release may be purchased, but it will be necessary to make the bracket. It is advisable first to make a model out of cardboard, using a thin resilient type, such as the kind used in a soda cracker box. After perusing the photographic illustration, cut the cardboard in an "L" shape. Then starting at the lower extremity, form the cardboard bracket into a triangle shape, with the apex directly over the motor release lever of the camera.

Next, after forming the triangle, extend the remaining portion of the cardboard strip upward toward the lens release button, at which point the surplus portion of the strip should be cut off, slightly narrowed and curved, in such a way that it will fit snugly under the lens release lever. Remember that the construction of this bracket involves the trial and error method, and the cardboard model should be perfected before attempting to make the duplicate in metal.

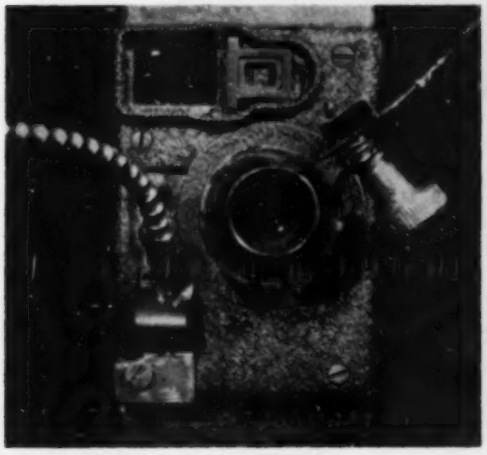
Then, with the aid of a hack saw, flat nose pliers, drill, dies, and small vise, using the cardboard model as guide, cut the bracket from a suitable gauge of brass or copper. Mark a place on the bracket where the cable will eventually fit, but in such a way that when the plunger of the cable is pressed, the tongue will strike the motor release lever of the camera. Drill the proper sized holes perpendicular to the bracket, thread with dies, then insert the cable. There should be two holes to accommodate the cable, one for continuous run, and one for single framing. Fasten the device securely to the camera by means of a screw at the lower portion of the bracket and also at the upper extremity by filing off the curved portion so that it will fit snugly under the lens release lever.

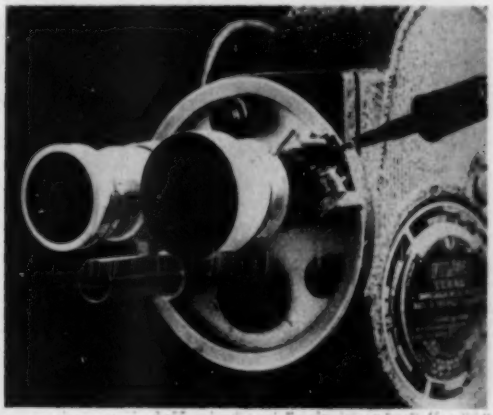
Fading Device

Unlike the procedure followed in making the cable release, the two fading devices necessitate the assistance of some one possessing materials, tools and skill suitable for fine mechanical work.

The device consists of a small lever, with an adjustable ring at the end, made of material capable of being expanded or contracted, and with thumb screw nut and tension spring for adjustment. Attached to the thumb screw nut, and extending toward the camera, is a small pin, which stops the fade, when fading in on a scene.

In order to use the device, first set the lens diaphragm ring of the camera at the proper f/-stop. Next, slip the ring of the fading device over the lens diaphragm of the camera, with the pin of the fading device abutting the view finder mask receptacle of the camera, being careful not to disturb the f/-stop setting. Tighten the thumb screw on the fading device, which will securely fasten it to the lens diaphragm ring of the camera. Close the lens diaphragm by moving the lever downward. To fade in, move the lever upward very slowly, until the pin strikes





Cable release and fading device on single lens camera (left) and turret model (right).

The fading device consists of a small lever with adjustable ring at one end. It appears on the cameras on page 173, right.

the view finder mask receptacle. This position, if the original setting has been correct, will be the proper aperture to photograph the scene. To fade out, move the lever downward until the lens diaphragm is closed.

Second Fading Device

This device utilizes the same fading lever used on the Sportster, but with the pin reversed and extending outward along the lens barrel. As turret models utilize objectives rather than view finder masks, thus eliminating the mask receptacle, a lens shade with pin extending perpendicular to the lens barrel is employed to stop the fade at the proper aperture, when fading in. And as the position of the pin can be changed by a slight twist, it is much easier to adjust where change of aperture is necessary.

In conclusion, fading, as a method of transition between motion picture scenes, can become very artistic, if accomplished with proper tempo and rhythm. This attainment is accomplished through practice, then review of one's work.

BOOK REVIEWS

ROME, PORTRAIT OF THE ETERNAL CITY, edited by Herbert Bittner and Ernest Nash, Henry Regnery Co., 20 West Jackson Blvd., Chicago 4, Ill., 200 pages, 8½x11, illustrated, cloth, $6.50, 1950. Obtainable from PSA JOURNAL.

A photographer, an editor, and an historian, Giuseppe Prezzolini, have combined their talents in this volume, which presents 170 photographs by Nash, arrangement and comments by Bittner, and fascinating historical data by Prezzolini. Whether one is interested primarily in Rome, in photography, in history, or in grasping an understandable idea of one of the world's oldest and greatest cities, the book serves well the purpose.

Both words and pictures demonstrate that Rome has been for centuries the battleground of schools of thought—art, architecture, religion, government, law, business, literature—and each has left its imprint. Furthermore, the book reveals the existence of several Romes—Vatican, city of priests; Piazza Colonna, city of government; Piazza di Spagna, city of art; Quartiere Ludovisi, city of fashion; Parioli, city of wealth; La Garbatella, city of poverty; and the Trastevere, city of the descendants of the Romans.

Ernest Nash, the photographer who lived some years in Rome, has used the Rollei admirably to illustrate the book, and to reveal the virtually unlimited photographic possibilities of the ancient city. Each gravure plate is embellished by background information, chiefly historical. The combined result is a volume which is distinctly modern in its approach, fascinating to read, enjoyable to view.

FRITZ HENLE'S ROLLEI, published by Hastings House Publishers, Inc., 41 East 50th St., New York 22, N. Y., 124 pages, 8 x 10, illustrated, cloth, $3.00, Jan. 1951. Available from PSA JOURNAL, postpaid.

Here are 87 photographs to prove that 20 years may be a long time, but that a chap with a Rollei can finish them young, handsome, and increasingly capable of working "professional" magic with an "amateur" camera.

Apparently nobody has told Henle that the Rollei lacks swings, tilts, interchangeable lenses, and other gimmicks. Henle looks at life, clicks the shutter, and produces pictures. Mostly he uses one type of film and one type of developer, plus lots of Henle.

Pictures and text tell the story of a young man and a camera and a dream, and of how he became a dream photographer. He wanted to see things and to picture them as he saw them. But somebody was always stopping him, or saying it was impossible. So Henle went out with the Rollei to try things for himself—and came back with pictures that were "impossible."

What the viewers-with-alarm overlooked is that Henle is an artist. He sees things with an artist's eye. But also with a photographer's eye, whether the subject be a nude-in-the-driftwood at Montauk, or St. Peter's-in-a-puddle at Rome. And he comes out with a photograph that is all picture, and a picture that is all photograph.

They're trying to pin on him the label of "Naturalist." Probably it won't stick, because he is, first, last, and all the time, Henle, creative photographer. Admittedly, he prefers to do things naturally. But his photographs still come out Henle! And pictures!

Anybody who wants to do things better should buy the book, look over the pictures, and then get started. He's got quite a long journey ahead of him!

"The Bells Are Ringing" by Charles Hoff, New York Daily News. From 1949 Graflex Contest.

"Sorrow in the Subway" by Sam Falk, New York Times. From the Complete Book of Press Photography.

DEATH OF A GIANT

Murray Becker, Associated Press

A Special Photo—Journalism Feature

Photographing Peru

BERNARD G. SILBERSTEIN, APSA

Indians walking from the market at Puno back to their homes on Lake Titicaca.

Llamas near Lake Titicaca in highlands.

FOR MANY YEARS I dreamed of going to Peru. Before the war, the eleven-day steamship schedule in each direction meant too short a time for picture-taking in the country itself. Now just twenty-six flying hours separated me from the legendary empire of the Incas.

In preparing for my South American trip, a friend asked me one day if I had formulated a definite picture-shooting schedule. "I suppose you've read everything you can lay your hands on," he said, "but can you really anticipate what you will take with your camera?" "You've brought up a very controversial subject," I explained. "If I were representing a news agency on the trip, the answer would definitely be 'yes.' However, the pictorial point of view is slightly different. A newspaper photographer records the facts—a pictorialist interprets them. The former involves expert craftsmanship—the latter, good technique plus imagination. Familiar landscapes are transformed into a pattern of beauty; stately trees take on a new majesty; the wind breathes life into the swaying cornstalks; cloud formations add drama to the sky. Some things ask to be taken; others are less inviting."

The night flight to Peru is a long one. Our stops at Havana, Balboa and Guayaquil in Ecuador were brief. Daybreak found us over the long barren coast of Peru with Lima still several hours away. The towering Andes come right down to the Pacific with nothing but desert and silvery water as far as the eye can see. Shortly we sighted Lima, an oasis fed by swiftly-flowing mountain streams.

One eighth of Peru's entire population live in this typically Spanish city of a million people. Royal palms and exotic flowers line the broad boulevards. Many of the buildings in the central area with their overhanging wooden balconies were built in Colonial times. High walls with massive metal-studded doors guard the lovely patios and homes inside. I was fortunate through mutual friends in being able to visit some of these homes. The Prado home particularly stands out in my memory with its huge gold leaf beds and priceless antique furnishings. Earlier Presidents and Generals were among the famous ancestors of this family. It was only after I visited a number of other equally impressive palaces (the word home is hardly accurate for such elegance) that I finally realized that the Prado house was only one of many viceregal mansions in Lima.

The better educated Peruvians pride themselves on their pure Castilian. Children of the wealthier families are sent to Europe for part of their education. Sidewalk cafes and the tea hour at five is typical of the old world atmosphere which I found in Lima. The museums are full of Inca lore, but you must seek more complete evidence of present day Indian culture outside of the Peruvian capital.

Because of the elaborate exteriors of the many public buildings in Lima, I found numerous interesting architectural shots to keep me busy. In addition, the port of Callao on the Pacific, which is only half an hour's drive from the city, is full of all types of ocean-going ships. There were two very photogenic four-master boats anchored about a mile out in the ocean which intrigued me particularly. I finally borrowed a row boat and took my pictures although the waves were rather high out that far. If you've ever been foolish enough to venture a mile from land in the Pacific in a row boat, you'll realize what difficulty I had in keeping my camera steady enough to take pictures. Passing a good sized octopus several feet from my boat on the way back to shore made it even more of an adventure.

As I rested on a bench in the Plaza de Armas one evening with a Peruvian friend, Carlos de la Torres, I reminded him of his promise to help

me follow the trail of Pizarro with my camera. He smilingly assured me that Pizarro's ghost was hovering over the Plaza at that very moment. "Tomorrow in the Cathedral across the street you can take a picture of his mummy lying in its glass-sided coffin. Then we'll go to the Presidential Palace on the other side of the square where you'll see in the courtyard the ancient fig tree still bearing fruit that Pizarro planted four centuries ago." Carlos kept his word and after photographing the tree, he showed me the Palace room where Pizarro was assassinated. "The whole city of Lima is full of historic associations with his memory," Carlos told me. "It has no Inca background and was founded by Pizarro after he had conquered the Indians."

Next morning Carlos phoned the good news that I had an appointment with Marcel Delboy, Director General of Information at the Presidential Palace. Senor Delboy was very cordial in our talk but explained that President Odria had never granted a picture interview to any foreign correspondent during the eighteen months of his term. "How do I know that the captions under your pictures of the President will not refer to him as a little Franco or Peron?" he asked. I knew the circumstances under which he had taken office in October of 1948 after a bloodless revolution. I was equally certain from careful inquiries that the people approved of the program which he had carried out since then. I quickly explained that my travels in Latin American countries had induced a personal affection for them which would make it unthinkable to permit any editor to caption my pictures in an unfavorable manner. With the fate of my Presidential Series in the balance, I showed him my album of newspaper clippings which I carry for just such emergencies, pointing out particularly the widely published series I had done on President Aleman of Mexico.

"Can you be ready at three o'clock?" Delboy asked me over the phone several days later. He called for me in one of the President's cars, and as we drove out towards the Summer Palace overlooking the ocean, he explained, "General Odria came from a very poor family in contrast to the wealthy background of

Indian woman near Lake Titicaca in the highlands of Peru.

most of the previous Peruvian Presidents. He's now fifty-two with an enviable thirty-one year record in the army. He told me that he plans to pose for you in civilian clothes because he does not want to stress his military standing in view of possible prejudice by North Americans against military presidents."

The carefully guarded palace gates opened for us, and while we waited for the President, Delboy showed me a magnificent view of the ocean from the front patio. I liked the President's friendly smile and handshake as he entered the library where I had set up my equipment. Rather short in stature, his broad shoulders and strong face made him an interesting subject to photograph. After some formal pictures at his desk, we adjourned to the front porch where he posed with his Minister of War and Minister of Interior. I wanted some informal pictures, but when I asked the President to sit on the balcony rail, he shook his head in disapproval. Other suggestions were vetoed as not being dignified enough for a Latin American President. He asked several questions as to other pictures I had taken in Peru and seemed pleased with my enthusiasm over what I had seen. In leaving, I promised to forward copies of the pictures by air mail from the States.

Taking pictures of famous people under pressure is often a trying experience Several years ago in photographing Padilla, Mexican Foreign Minister, with his family at his home in Mexico City, I found myself in the embarrassing position of not having extra batteries for my flash gun when my other ones suddenly stopped functioning. I have never been caught without extra batteries since then.

Don't hesitate to ask your sitter to deviate from a conventional pose for a picture because it is often the unusual ones that are the best. For example, in taking pictures of President Aleman of Mexico in his home, after a series of pictures with his family, I noticed a fine military portrait of General Aleman, his father, on the wall. I decided to ask the President to pose next to the portrait so that his head was within the frame of the picture next to his father's. To do this, one of his aides procured a footstool from another room and by standing on it, the height was just right. With the help of the President's wife to bring a smile, I had my picture which has been published many times in *Time, Business Week*, etc.

In all cases where the sitter's time is limited, try to explore the premises beforehand so that you have three or four different backgrounds in mind when you are ready to shoot. It is more interesting to choose backgrounds which in some way reflect the character and position of your model. Naturally, too complicated a background with confusing mergers should be avoided. Always have your equipment set up and ready. I use a light weight light stand to hold my flash gun high enough and at about a forty-five degree angle with an extension for a fill-in light on a convenient chair near my camera lens.

Dr. Gieseke, the Cultural Attache of the American Embassy in Lima, helped me plan the highland part of my trip. "You'll find Lake Titicaca and the bordering villages a never ending source of pictures," he said. "In the eyes of the Incas, the Lake had great sancity; the founder of their dynasty, Manco Capoc, and his wife, Mama Ocllo, were supposed to have first appeared on the Island of the Sun in the center of the Lake, and later the Incas built a huge temple there."

Arequipa in southern Peru is as far as you can fly on the trip to Lake Titicaca. The twelve-hour train ride up the steep Andes to a height of almost 16,000 feet, before starting down once again to the Lake, is a thrilling experience to tourist and photographers alike. Constantly twisting, and switching back to gain altitude, ranges of snow-capped mountains were always in view. It was the first time I saw herds of llamas with their graceful long necks. I was told that they seldom are found below ten thousand feet. The Indians find them useful not only for their wool but also as beasts of burden.

Martin Chambi, the most prominent pictorialist in Peru, is taking a picture of an Indian in his Cuzco studio.

"You'll be more comfortable in the first-floor rooms until you've become acclimated," said the hotel clerk when I registered at Puno. He was so right! Everything was an effort, even walking on a level at Puno's altitude of 12,500 feet. My cameras and equipment were often too heavy a burden to carry and I found it necessary to rest frequently. Having taken pictures only three hours in rather weak sunlight the first day, I was surprised to discover the next morning that my eyes were swollen shut—I had underestimated the intensity of the ultra violet rays at such an altitude.

My meagre Spanish was of little help in photographing the Indians around the lake region because they speak Aymara, and I had similar difficulty later in Cuzco where many speak Quicha. However, the sign language has always solved my problems and Peru was no exception.

I remembered Dr. Gieske's story of the boats on Lake Titicaca when I saw two medium-sized combination passenger and freight boats in the harbor at Puno. "The boats were built in Scotland in 1880," he had told me, "then sailed across to Peru, taken apart, and carried up on mule back to the lake before the railroad was built. Re-assembled, they form the major means of transportation to land-locked Bolivia at the other end of the lake."

You've all seen pictures of balsas on Lake Titicaca, the raft-like Indian boats made from reeds. To my great disappointment, I found that their reed sails were no longer used, and modern wooden boats had replaced most of the balsas.

The picturesque town of Cuzco with its red-tiled roofs and narrow stairway streets is the magnet to which all tourists are ultimately drawn. My good friend Carlos'

family once lived in Cuzco where they owned vast farmlands. "While Cuzco now has a population of only 45,000," he told me, "at the height of the Inca Empire it was their sacred capital with more than 300,000 inhabitants. It was so sanctified in the eyes of the Indians that they looked on Cuzco almost as a god rather than a city, and to this day they touch their hats as they approach it. The conquering Spaniards found magnificent Inca palaces covered with gold leaf and filled with fabulous ornaments which beggared description. It is worth mentioning that the Indian word Cuzco means the navel of the universe."

The lower altitude of 11,500 feet in Cuzco made my photographic activity a little less arduous. One of the things I enjoyed the most was pursuing photogenic llama herds over mountainous terrain. I never really felt that I had taken enough pictures of this strange, half comical animal.

Cuzco still has ample evidence of its early Inca origin. The Spaniards built their palaces and churches on top of Inca walls so the original Inca stones line most of the streets.

"If you want an Indian picture story," Dr. Gieske had told me, "be sure to visit Thomas Payne of Urco, an Evangelical Mission, in the Yucay Valley not far from Cuzco." Mr. Payne provided horses as soon as I arrived, and we toured the farm owned by Urco. I had always thought of a farm as a large level area. "Our property of nine square miles includes three snow-capped mountains," Mr. Payne explained. "We cultivate and raise our own potatoes, wheat and corn up the steep sides of the mountains right to the snow-capped peaks."

I learned that the name Urco comes from the Quicha Indian word Orrcco meaning mountain. The property deed was originally given to the current Viceroy by Charles III of Spain. There are over forty Indian families living on the farm, some remaining all their life on the upperlands next to the snows and seldom coming down to the valley. He pointed to some tiny white specks near the top of a nearby mountain and explained they were cows belonging to the farm. I was surprised to learn that they graze on the side of the mountain during the entire span of their life, and have never experienced walking on level ground.

President Manuel Odria of Peru at his desk in the Summer Palace at Lima.

I asked Mr. Payne if there was any difference between the upperland and lowland Indians' method of working. "Each upperland Indian," he explained, "has some cows, sheep, ponies, and land on which to grow his food. They work one week for Urco and one week for themselves. The lowland Indians also have a patch of land on which they generally grow corn and have a vegetable patch. They receive wages and work all year for Urco but have days off with permission to cultivate their land. They make a little more than the upperland Indians." When I questioned him about the extent of mixed blood, he said: "The upperland inhabitants are pure Indians and prefer the colder living conditions, apparently because they were born there. The lowland Indians are mostly Mestizo, which, as you know, involved mixed Indian and Spanish blood."

Mr. Payne was very helpful in arranging to have some of the Indian families on the farm pose for me. Previously, I had experienced considerable difficulty in securing anything but "sneak" shots of Indians because of their superstition against being photographed. However, with his friendly intervention, I made a series of pictures illustrating the daily life of an Indian family which has already been quite successful. One shot which I value was the result of his arranging with the goat herder to bring his flock down a steep mountain path towards my camera. Another picture which I wouldn't have secured without his help was of the missionary school in session. The children were on vacation but he arranged with the teacher to have them reassemble for a synchronized flash shot that I took in the school room. Having flash equipment made possible many pictures that I otherwise would have had to pass up.

I started my last and certainly one of the most interesting picture story I have ever attempted after my return to Lima. My invaluable friend, Carlos, persuaded the Guano Corporation, a government monopoly since 1936, to let me do a series on Guano. For those who have never heard the word, Guano comes from bird droppings, and is definitely big business. It serves as a rich fertilizer, sells for $100 a ton, and over $400,000,000 has been exported, more than all the value of the gold and silver mined since the time of the Incas.

No picture series had been taken of the Guano islands since *Fortune* did an article in 1937. Navy boats

patrol the eighteen islands off the coast and prevent anyone from venturing within a mile without permission. On the boat trip to San Lorenzo Island near Lima, I photographed long lines of Guanay birds flying in fascinating patterns, often several miles in length. We saw nothing after we landed until we reached the summit about a thousand feet above the ocean. My first view of the top of the mountain was breath taking. "There are at least 500,000 birds here," the government engineer estimated. Noticeable movements frightened the birds so it took me a full hour to advance one hundred feet which was close enough for pictures. A quick step forward after I'd taken a number of shots gave an entirely different study—thousands of birds rose in a cyclone of feathers, dust and deafening noise to escape the enemy.

During the trip back to Lima, my government guide told me that the cold water along the coast of Peru was due to the Humboldt current slowly moving up from the Antarctic. The fish on which the Guanay birds feed prefer cold water. In removing the Guano, workmen land on the islands every two years to load it on waiting freighters.

Having explored Mexico with my camera on nine previous occasions, a comparison of the two countries might be of interest. Mexico has only a few snow-capped mountains whereas there are literally hundreds of them in Peru. To me the mountains in Mexico are less forbidding. I shall never forget my flight up to 22,000 feet to clear some ranges in the final lap from Cuzco down to Lima.

Peruvian costumes are comparable in color to those in Guatemala, and consequently are more interesting than the blacks and whites prevalent in most areas except southern Mexico. The Amayra Indians on Lake Titicaca, especially the women with their derby hats, are very photogenic. Visiting and taking pictures in the higher altitudes of Peru is much more strenuous although I found very satisfactory hotel accommodations.

Archaeologically each country has its own fascinating points of interest and a comparison is difficult. Peru has nothing comparable to the Pyramids of Mexico nor the excitement of Particutin during its active eruption. On the other hand Machu Picchu, "The Lost City of the Incas," is a thrilling adventure not comparable to any experience I've had in Mexico. The weaving and pottery of the Incas is equal to the artistic achievements of the Aztecs, but the amazing Aztec Calendar and their mastery of writing was never achieved by the Incas. No one has ever found any indication that the Incas formed letters or transmitted written messages.

Photographically, Mexico attracts me more than Peru, but I haven't spent a comparable length of time in Peru so this judgment is subject to revision. Mexico is a land of singing mariachis and gardenia-filled canoes, a land of enchantment where purple bougainvillaea grows in the humblest gardens. Mexicans seem to be a happier people and I suspect that the higher altitudes and the more difficult living in Peru may explain the difference.

I carry two Rolleiflexes on all my trips, one loaded with Ektachrome and the other with Super XX. I like fast panchromatic film for depth of field and the ease with which I can take more difficult pictures involving minimum light conditions. I prefer using a tripod wherever possible, but some pictures have to be hand-held, either because of a difficult camera position or greater mobility. On top of my tripod I have an aluminum piece about two by twelve inches, on which I can mount swivels for both cameras side by side. Two long cable releases allow a simultaneous exposure with both color and black and white. Occasionally, an editor will say on seeing a transparency, "I wish you'd have taken it in black and white." The double take with two cameras solves that problem.

Take plenty of Ektachrome with you to Peru because I found none down there. However, there was plenty of 35mm Kodachrome and also sufficient black-and-white film of all sizes and types. Blue flash bulbs are likewise not available. An exposure meter is a necessity, especially in the higher altitudes. Exposed film can be taken out of the country undeveloped without difficulty.

I predict that an increasing number of American tourists are going to discover Peru in the near future. I feel that I've only scratched the surface of this fascinating country so I'm already planning a return trip.

Free Speech?

An egg spatters on the head of Norman Thomas, Socialist Presidential candidate in the 1938 elections, while he makes a speech at Newark, N. J.

Photo from Complete Book of Press Photography, by Ralph Morgan.

THE STORY OF

A Great Photo-Documentarian

A REVEALING AUTOBIOGRAPHY DELIVERED AS THE FIRST FREDERICK W. BREHM LECTURE

ROY E. STRYKER *

I AM HONORED by the invitation to present the first in a series of lectures established in the name of Frederick W. Brehm. Mr. Brehm was born 79 years ago in Waterloo, New York. His parents came from Germany during the suppression of liberalism in 1848. Part of this wave brought practical, industrious people with strong traditions of craftsmanship to New York State and the Middle West.

The America of Brehm's boyhood verged on a vast social and economic transformation brought about by inventions including the telephone, talking machine, and gasoline-powered automobile. These were truly the inventions of a democracy—tools for mass communication. . . . During that period the democratic spirit seized upon a far older invention—the camera—and through refinements—the dry-plate, roll film, and the Kodak—transformed it into a tool of expression and communication for the millions.

Mr. Brehm was one of the elite trade of woodworkers and finishers. He first worked in furniture and piano factories, but very early in his career he associated with photography. He worked with the F. A. Brownell Company, designers of the first roll film pocket Kodak and suppliers of wood bodies for the Eastman Kodak Company.

Until about 1905 Brehm worked for several other companies and developed into a camera technician with a genuine talent for design. At the Gundlach-Manhattan Optical Company he designed cameras using a plate film pack. Later, at the Century Camera Company he helped perfect the "Cirkut" panoramic camera, utilizing principles which are found today in the Sonne Aerial Camera. . . .

In his next period of development, Mr. Brehm became a professional photographer in Rochester. He made stereographs for the Keystone View Company. . . . I like to think of Frederick Brehm as one of that band of itinerant view-makers whose work brought the reality of rare places into millions of prosaic American parlors.

Mr. Brehm's career reflects an early interest in the photograph as a historical record, or document. He photographed Buffalo Bill's Wild West Show. He also recorded the Scottish Highlands, revealing a scientific turn of mind in studies of highland cattle and sheep.

Shortly before World War I he rejoined Eastman Kodak Company and was at various times in charge of Industrial Relations, head of the Engineering Department, and finally general manager of the Camera Works. He established a course in photography for company employees, forerunner of the present impressive department. He also developed a course sponsored by Eastman Kodak Company which was given during summer sessions at Oswego State Teachers College and at Cornell University. In 1930, when the Department of Photographic Technology was organized, Mr. Brehm was loaned to the Rochester Institute as instructor in photography, a position he filled until his retirement in 1945. An example of his forward-looking educational ideas was the modest but significant project in which he directed photo-documentation of the historical background of the city of Rochester, New York.

These facts indicate a rare personality. They reveal a craftsman who could turn his talents to many lines of endeavor. It was men of Brehm's type who brought America a long way toward social and technological maturity. And, let me point out again: Brehm was interested not only in technical perfection but also in using photography as a tool of social history.

Development of the Camera for Social Documentation

The camera as a social instrument is almost as old as photography itself. Mathew Brady did his great Civil War work some 25 years after Daguerre's process had been brought to this country. Jacob Riis, whose book, "How the Other Half Lives," is a milestone of social progress, carried on the tradition in the 1890's. He used the camera to drive home deplorable slum conditions. It was Riis, too, who pioneered in using the flash light.

Then came Lewis Hine who used the camera to portray the heart-rendering plight of child laborers, particularly in coal tipples and sweat shops. His work provided an important impetus to the great progress made in the reduction of child slavery since that time. . . . In spite of the effectiveness of the work by these pioneers in recording social history, there have been long, hard-to-explain arid periods. One of these occurred in the early twenties.

* In 1950, PSA member Roy E. Stryker was chosen by the Rochester Institute of Technology to receive the first Frederick W. Brehm Medal and give the first Memorial Lecture. Because of its significance and because Mr. Brehm was a PSA member for years, we are pleased to present excerpts from this historical lecture. Mr. Stryker is now Director of the Photographic Library at the University of Pittsburgh, where he is continuing his great work of documentation. FRED QUELLMALZ, JR.

ROY E. STRYKER Parks—Standard Oil

Indeed, the camera might have been diverted entirely had it not been for Alfred Stieglitz, Edward Steichen, and Clarence White who rescued it from artificiality. All of us owe them a great debt for restoration of honesty, frankness and forthrightness.

Corollary to the camera for social documentation, came development of news photography, a less direct implementation, but one which was to prove a great social force. The news picture, in turn, was dependent upon development of photo-engraving. Before this process was invented, news photography as such did not exist. The best the early pictorial weeklies could do was to let an artist make an etching on copper plates from the photograph.

First medium of mass communication in the United States which owed its growth to the reproduced picture was the *Midweek Pictorial* which flourished during and after the first World War. By that time we had photo-engraving, and improved cameras. One more development was to come which would profoundly affect pictorial journalism. That was use of the candid camera by Dr. Erich Solomon who did his pioneering work for the Ullsteins in Germany around 1930.

When pictorial journalism flourished in the mid thirties, it had all the tools with which to work with the possible exception of high-speed photography. . . .

Although I dislike introducing a personal note, I owe it to this group to tell something of my own work as a clue to why I am here to receive the first medal commemorating the work of Mr. Brehm.

Mr. Brehm and I had something of the same early exposure to photography. We were both brought up on the basketful of cabinet photographs or sets of stereographic pictures. These were a dominating influence in my life. They were reflected in the interest with which I later awaited the magazines which brought pictures into our ranch house, and through the lifelong fascination which Sears Roebuck catalogues have always had for me.

But there, I fear, my similarity to Mr. Brehm comes to an end. Mr. Brehm was a craftsman to his fingertips. I have nothing of the craftsman about me. My only implement in life has been an insatiable curiosity about everything and everybody. And of this, through a series of fantastically lucky circumstances, I have been able to make fullest capital.

Teaching at Columbia

It may seem surprising that after several false starts I set out to be an economist. I came to Columbia University bent on making economics my life work. But I can see now that my approach was always descriptive. I was more interested in getting across some idea of what a bank looked like inside and out than filling students with abstruse theories of the why's of the interest rate.

I got impatient because the bright boys at Columbia had never seen a rag doll, corn tester or an old dasher churn. I dug up pictures to show city boys things that every farm boy knows about.

Everywhere I went I kept a pocket full of notes filled with ideas for pictures. I wanted the kids to see things for themselves. For years I ran a series of tours. I took my students to printing plants, banks, and produce markets to show these same city boys what their own city looks like.

Because of my interest in pictures I lost my chance at a Ph.D. I thought I was a failure. I spent hours trying to figure out where I was going, what was going to become of me. But if I didn't know where I was going, my boss, Rex Tugwell, did. He said, "Roy, you'll never make an economist. But you can teach in another way—a better way—the way you know, with pictures."

He gave me the chance to illustrate a book, "American Economic Life"—he also gave me the chance to be a co-author. Economists said it was sociology; sociologists said it was just a collection of pictures. But regardless, it was a milestone in my relation to the photograph.

With the Farm Security Administration

Tugwell went to Washington in the exciting early days of the New Deal and shortly thereafter sent for me. In this way he gave me my great chance. He wanted to prepare a pictorial documentation of our rural areas and rural problems, something that had always been dear to my heart.

My first job was with the historical section of the Resettlement Administration, later the Farm Security Administration. My charter was a curious one. Tugwell put it this way: "Roy, you've got a real chance now tc tell the people of America that those in distressed areas are the same as everybody else except they need a better chance."

I worked in the FSA for nine years. Out of that period came a file of about 300,000 pictures. The people who took the pictures insisted on seeing the American scene whole rather than in part or from one point of view.

The face and back of the Frederick W. Brehm Memorial Lecture Medal. The first medal was awarded to PSAer Roy E. Stryker by the Rochester Institute of Technology in 1950.

Because of this we came up with a rather thorough coverage of rural and American small town life.

When the war came, and our pictures were urgently needed to show the world what we in the United States were really like, we were ready. Our file of material on the main streets in little towns, farm homes and the homes of workers, showed how we celebrated our national holidays, and all the little homely daily rites that make up our lives.

Everyone who worked through those nine years got a terrific gratification out of the experience. No credit is due to us. We hardly knew what we were doing, let alone what we were accomplishing. All we knew was we were having a whale of an exciting time, doing things very close to our hearts.

Today, we have the satisfaction of knowing that the fruits of our labors rest in the Library of Congress alongside the Brady prints and the great Jackson photos. They are part of the permanent documentary record of the life and times of our nation.

And who were the photographers who built this file? It would be hard to imagine an aggregation of people with more varied backgrounds. Among them were: an aspiring engineer; a man just out of college who had hoped to be a doctor; a woman artist on fire about the plight of the under-privileged; a musician; another artist who had become interested in the camera as a note-taking device; a school teacher turned reporter, turned photographer. Perhaps there was something about the times, something about the assignment; but all of this group went beyond themselves in a kind of dedication to the work.

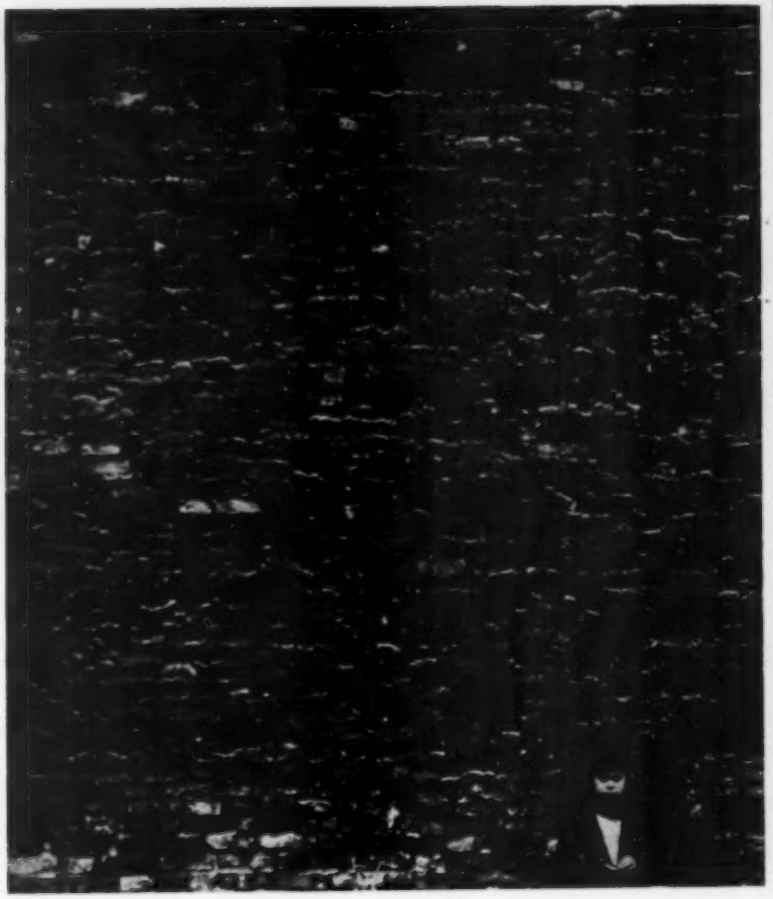
Well, that phase of documentation came to a close . . . but my luck still held. I had always been interested in industry as one of the dominant forces of our present-day culture, and was mildly annoyed that industry had been so remiss in presenting an honest, forthright story of itself, its operations, its relations to the community, and its reason for being. I had long thought I would like to tackle such a job. The Standard Oil Company (New Jersey) gave me the opportunity. Again we started from scratch, with empty quarters and a charter from the Company to document oil in human and technological terms.

I shall always be grateful to the Company for the latitude which they gave me. When our photographers moved into a community, they covered the oil installations, but frequently they also showed us how the people lived, their homes, their churches and their schools. To this practice the Company heartily subscribed. . . .

It was not such a pioneering effort as the experience in Washington. I was fortunate in having many of the good people who had gone through that stimulating experience, and who were trained and skilled reporter-photographers. Also I had the facilities of the Company for expediting travel and introduction in strange places—not to mention generous financial support which in an undertaking of this kind is not to be minimized.

Again, we were able to make a contribution to the sum total of recorded social history, a contribution which in a way complements the one now in the Library of Congress, for this is industrial America, the other side of the coin to rural America. Maybe it too will be taken over by the Library of Congress some day. In any event we hope it will always be available to historians and sociologists.

Let's have a look at where I go from here—and what is really important—where does documentary photography go from here? As for me, I know that wherever I am, whatever the condition of the world, my passion



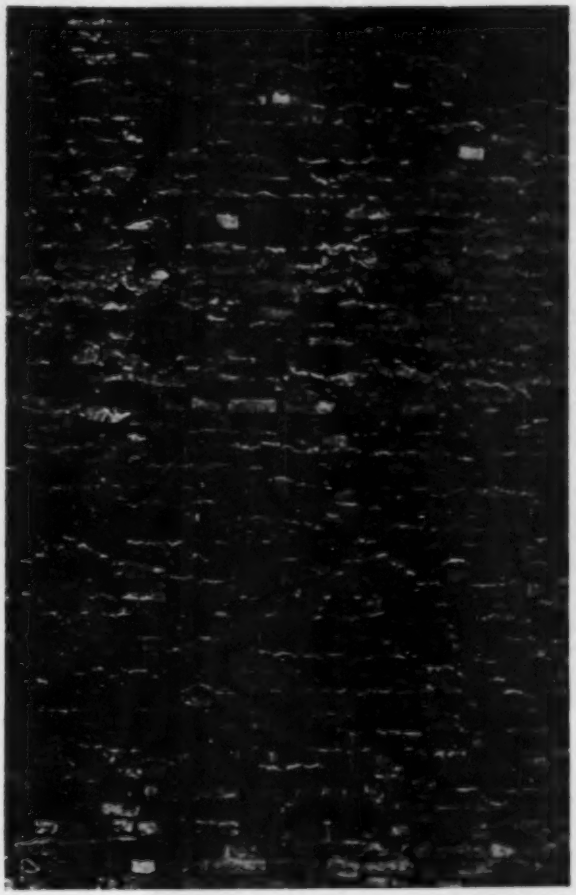
BOY

will still be for recording the current time for posterity with the camera as long as I can find somebody to underwrite my aberration.

And what of the future of the camera as a social instrument? As we pay tribute to Mr. Brehm and look back at the impressive record of the Eastman Kodak Company and others in developing the picture-taking device, we can't help but think that this is another reflection of our American character. This character shows up magnificently in one respect and not so well in the other. The magnificent side is that of technical achievement. Here our record in this, as in other fields of mass communication essential to the maintenance of a healthy democratic nation, can only be a source of pride.

Where we must pause for stock-taking then, is in our uses of these great media which our gifted technicians such as Mr. Brehm and his successors have given us. Here we must put pride aside and don the cloak of humility. We must humbly remind ourselves that the camera, no matter how great its technical excellence, can never go beyond the spirit of the man who operates it. The camera is, inescapably, an intimate instrument. It records for a fraction of a second a fellow being as he is. The man who operates it for public dissemination must have a deep sense of respect for all human beings. I always have detested the sneak snapshot. The photograph should never be used as medieval bear-baiting or a Roman holiday to bring amusement to the masses at the expense of any human being.

There is considerable indignation concerning this photographic invasion of privacy. I feel it is not too much to say that the very future of the photograph as a social instrument is dependent on this single one element—maintaining a basic respect for human dignity.



JOHN P. KEENER

SIX STATES

PHOTOGRAPHY

JACOB DESCHIN, APSA

THEY put up "a new kind of photographic show" in Milwaukee a few months ago, the concept of which if taken up in other areas of the United States could in time result in exhibitions truly representative of American photographic activity. The show was sponsored by the Milwaukee Art Institute, under its director, Burton Cumming, had the cooperation of a working committee from the Milwaukee Photo Pictorialists, and was financially supported by the Boston Store.

It was called the Six States Exhibition because entries were limited to photographers, amateur and professional, resident in the region comprising the States of Illinois, Indiana, Iowa, Michigan, Minnesota and Wisconsin. The show's sponsors had four objectives:

1. Help re-establish standards of quality in photography.
2. Enable the general public to see photography as a creative and communicative medium.
3. Offer an annual opportunity for the creative photographer in this region to show his work.
4. Accumulate, by purchase, fine photographs for the permanent collection of the Milwaukee Art Institute.

About ten percent of the accepted prints were purchased by the Institute for its permanent collection. Selected prints were purchased at the rate of $25 a print or $50 for a picture series.

The jury consisted of John Morris, picture editor of *The Ladies Home Journal;* Arthur Siegel, freelance photographer and designer; and Roy Stryker, chief of the Pittsburgh Photographic Library at the University of Pittsburgh.

The conditions of entry were simple: "Each exhibitor may submit up to ten individual prints, or ten picture stories, or ten series, or any combination of individual prints and picture series (stories). . . . Each photograph

OLD AND NEW

Paul L. Rouse

HOUSE OF REPRESENTATIVES — Frank J. Scherschel

must be mounted on lightweight cardboard. Any size print will be accepted. Contact prints or enlargements will be judged on their merits as photographs, not on their size. No hand-colored prints nor transparencies, black-and-white or color, are acceptable. Color prints will be welcome." There was an entry fee of $1 regardless of the number of prints submitted.

The pictures came, the selections were made and a show was hung on the walls of the Milwaukee Art Institute from September 8 to 30, 1950 that consisted of 207 photographs in many categories by amateur and professional photographers in the region covered.

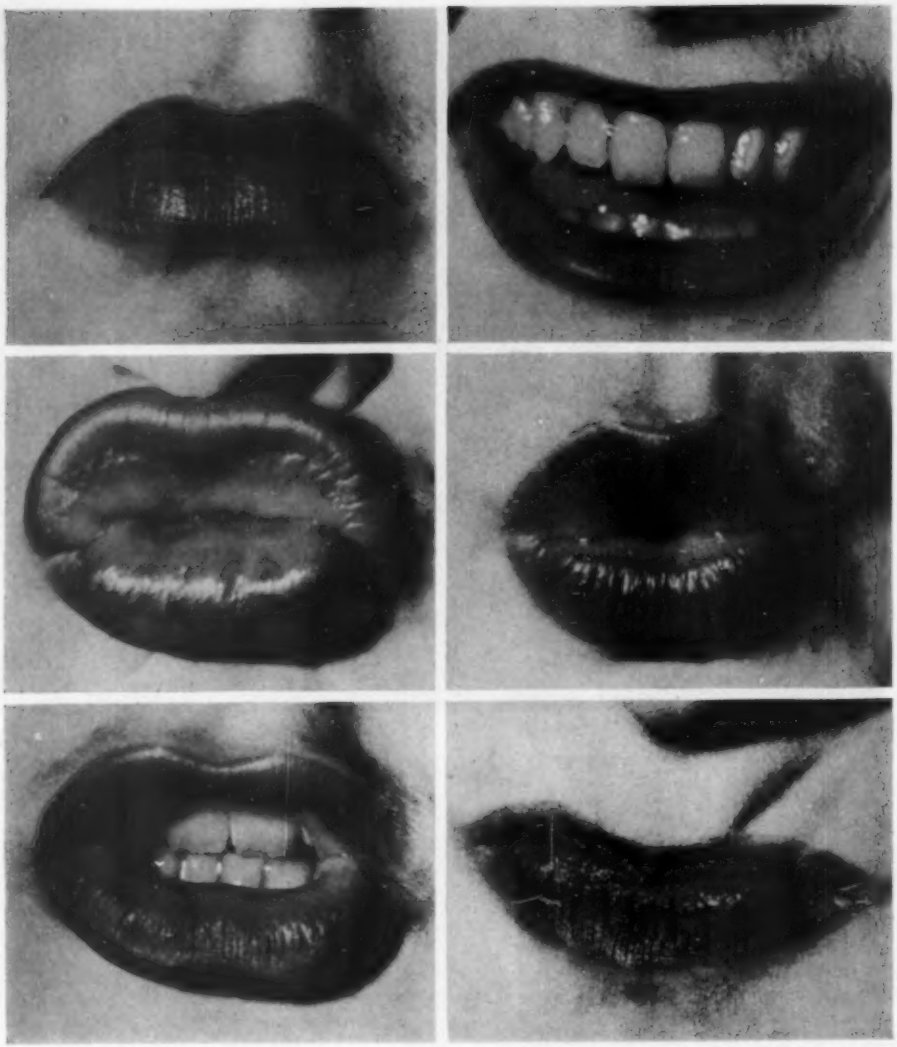
When the show closed, an experiment had been completed which, if not altogether successful, demonstrated an idea of incalculable potentiality: the participation in a single show by photographers at all levels of creative ability and over a wide range of photographic endeavor.

The failure of contributors to send pictures describing the local environment of the six states weakened the regional aspect of the show but left intact the institute's principal objective: to show photography as a creative and communicative medium capable of interpretation in many different ways.

Iowans were not represented, either because they did not contribute or because they failed to make the grade in the judging. About fifty of the sixty-seven photographers whose pictures were hung were from two of the states, Illinois and Wisconsin. The fewest entries came from Minnesota. In all, only 135 persons entered pictures from the entire region. Of the 1,109 prints they submitted only twenty percent were accepted for display.

These figures were not impressive, nor did the pictures as a whole represent the best work of the best photographers in the region, as a show of this kind should, though many were outstanding examples of contemporary photography. In examining the entries the jury found a number of serious lacks: very little use of the miniature camera for unposed, intimate, revealing shots in natural light; very little in the way of good sports or news photographs; poor commercial and industrial entries, showing "the heavy hand of the art director"; inadequacy of the entries from the university photography departments; very few explorations into the possibilities of color. Incongruous as it may seem for a show of this kind, a large number of baby pictures were submitted with, as usual, very few that had any merit.

Probably the greatest disappointment of the exhibit was the lack of pictures that show how the people of this region live, work and play—the small-town life so characteristic of the Midwest, the farm life and agricultural activities, pictures of the industrial life that abounds in this area.



LIPS

Lyle R. Mayer

Boy with
Pilots Helmet
John Szarkowski

Children
of
Yucatan
Diana Woelffer

INDIANA POORHOUSE

Wallace Kirkland

Despite such shortcomings, the variety of the pictures, demonstrating the versatility of the photographic medium, gave the show a fresh, exciting appearance. Unburdened by cliches, the exhibit was many shows in one, a kind of display case of what photographers can do once given the opportunity to make pictures on their own rather than according to a formula.

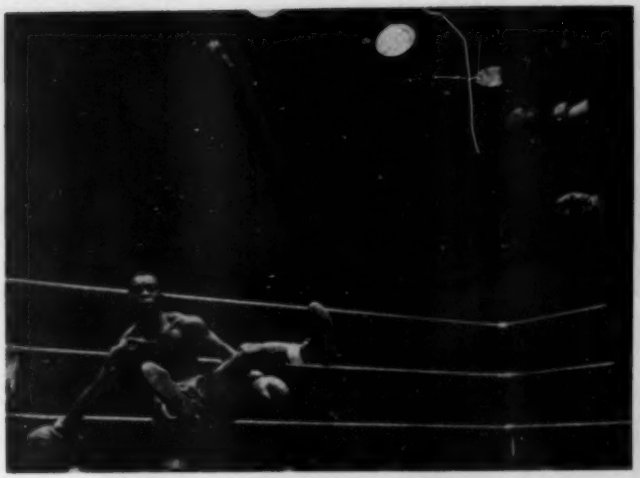
The subjects ranged from snapshots of babies to experiments in color and in black-and-white. The picture stories were among the most exciting in the show. These included a series of five pictures by Angus McDougall showing Milwaukee people jumping over a puddle; Frank J. Scherschel's ten-picture series of a labor convention; Wallace Kirkland's fourteen-print picture story of an Indiana poorhouse; Walter Allen's Chicago Elevated series, and others. In fact, the picture series by nine photographers dominated the show with eighty-six prints out of the total of 207 on display.

Other pictures included many documentaries, some striking pictorials; scientific subjects, such as extreme magnifications of crystals, industrial closeups, pattern arrangements, a variety of experiments and abstractions, city and water views, candid and formal portraits, pictures taken by day and night, in all kinds of weather and all seasons. Selection apparently was based on whether the picture or series had anything worth while to say regardless of technique.

The Milwaukee show and the purchase of some of the pictures by the institute were made possible by a subsidy of several thousand dollars provided by the Boston Store, which left the handling of the show entirely up to Barton Cumming, director of the institute, who described this support and confidence as "a new kind of department store subsidy."

An Expert *Sports Photographer* Tells How It's Done*

CHESTER GABRYSIAK



WITH THE GREATEST OF EASE
Chester Gabrysiak, Chicago *Tribune*

THERE ARE two major aspects about sports photography. First, the thing to photograph is *action:* A knockdown in boxing, the finish in a race, a runner sliding into base on the diamond, the scramble around the nets in hockey or for a rebound in basketball. Second, even when you try for action, catching it at its climax is largely luck.

For example, take a baseball game, where four photographers are shooting a man sliding into home plate. You'll find that each of the four pictures will show a little different action.

In the prize-winning boxing picture with this article, I used a 4 x 5 Speed Graphic, with a 4.7 Ektar lens, stopped down to f/8, synchronized at 1/400th of a second with four overhead Edgerton speed lamps. I was just lucky enough to be on the right side of the ring to grab a shot of the fighter's face instead of his back, and lucky enough, too, to have the shutter click while he was completely airborne instead of a moment too soon or too late.

You undoubtedly know what cameras to use on different assignments so I won't go into that. But you'll find that with a 4 x 5 Speed Graphic you can cover practically any assignment. I find this camera is best for all around coverage, in news as well as sports.

Boxing, from a sports photographer's point of view, is my favorite sport. All there is before you is an enclosed ring with two men, neither of whom can get out of it, barring unusual circumstances. Furthermore, except for a quick knockout, you have at least several rounds in which to shoot your stuff, and no chance of anyone getting in the way except the referee, who usually is careful not to.

Football is a game I like to watch, but despite the plentiful chances for good action, I am not too fond of photographing it for several reasons. On most games, especially those played out of town, there is scant time to take pictures early enough to be back in the office for use in the paper that night. Other reasons are that at many games the light is bad, it gets extremely cold, and working a camera with slow-moving fingers is a real job. Then, too, it is usually at football games that we sports photographers meet amateur cameramen. They're undoubtedly lovely people, but they do have a bad habit of getting in the viewfinder of what we laughingly call the "working press" right at the wrong time. *The Tribune* All Star Football game is a good example of this.

I wouldn't urge any ban on amateur photographers—don't get me wrong. They do some splendid work, sometimes better than the professionals, but I would urge that they take care, as some of them do, to keep out of the way of the other fellow's lens.

I started to work on *The Tribune* as a copy boy, was promoted to the photo room where I worked as inside man, learning to mix chemicals, and printing. After two years I received a camera and my first assignment covering a news event. I covered news for the next fifteen years before being assigned to sports, and if the two years on the latter beat are enough to make a comparison, I prefer sports to news, both for quality of the pictures, and the lack of unexpected complications when you're snapping sports subjects.

Twice on news work I have had my camera smashed. Other news photographers have had this happen far more frequently. Once a few years ago, there was a lake front

* Excerpts from a talk given during Journalism Week at the University of Missouri. Mr. Gabrysiak is Staff Photographer of the Chicago *Tribune*.

TWO UP—TWO DOWN! . . . Monroe D. Stroecker, of the Detroit *News*, caught this shot as the umpire landed on his neck. From the Complete Book of Press Photography.

night fire in Chicago, and we took photos of two married men and two married women—unfortunately not married to each other—who were on a cabin cruiser when the fire broke out. One of the men walked up to me and offered me money for the plate and while I was talking to him the other man sneaked behind me and knocked my camera to the ground. The police reporter assigned to cover the story with me gave me a hand and we had them arrested. The picture appeared in the paper the following day and the man who broke the camera bought me a new one.

The other incident concerned two highway patrolmen arrested and later convicted for high jacking. I took a picture of them as they were led from one room to the other in the State Attorney's office, and while I turned my back and was changing holders, the wife of one of them hit my camera, which broke when it fell to the floor. Her cousin, a Chicago policeman whom I knew quite well as he had helped me on several different stories, came over and offered to pay for the damages. About an hour later as I left the building she was waiting for me and I thought I would have more trouble. She called me over and apologized and invited me to her home for a spaghetti dinner . . . Don't look so wise, I didn't go!

In addition to the suggestions I have made for shooting action at its peak, which many beginning cameramen seem to overlook, there are a few more rules which I have found useful.

Among them one of the most important is the hard and fast rule of never getting into the way of players, judges or other officials during a contest, and of showing as much consideration for your subjects as you would expect them to show if the situation were reversed. I can remember one time, at least, when I violated the keeping-out-of-the-way rule.

It was at a hockey game between the Chicago Blackhawks and another team I won't name. We had been told that when a certain opposing player got on the ice, there was apt to be a revival of the feud left over from the preceding game. So I was prepared for it when one of the Hawks swung a high stick and clouted the enemy across the head.

I jumped over the rail, slid across the ice and made a quick shot of the two swinging at each other. I was about to change bulbs, (this was before strobelites were in general use) when I became conscious of something singing past me.

Only then did I realize that the referee had failed to halt the game, and play was still on. He stopped it then, however, skated over to me and said, rather coldly I thought, that I would have to get in uniform or stay off the ice. I stayed off the ice.

This seems as good a time as any to mention the man whom I consider one of the best sports photographers in the country. He is Ralph Kestly, and he worked for *The Tribune* and later for the Chicago *Times* before going into business for himself. Kestly could sit at a baseball game for six or seven innings and not make a picture, while we would shoot every possible play, but when the play of the game came up, he would click his shutter and have the outstanding picture of the day. This was a gift he carried over to other sports as well and came up with the best pictures.

There's not much point in covering the entire sports field, game by game, but I might mention that track, with a designated finishing spot, is one of the easiest to cover, while bowling, billiards and other non-contact or mild contact sports like fencing are among the hardest.

There is little trouble photographing golf matches, if you are careful not to click the shutter on the green, where championships are won and lost, just as your sub-

AIRBOURNE . . . by Carl Franks of Cedar Rapids, Iowa. A prize winner from the 1950 Graflex Photo Contest.

Two examples of excellent sports photography by Chester Gabrysiak, of the Chicago *Tribune*. Left—a scene from the Illinois vs Indiana game. Right—Stealing Home. Both have caught action at its peak.

ject is about to putt. Even in a sand trap most golfers have concentration enough so that an actual photo of the explosion shot doesn't bother them. Most of them will go out and let you make pictures of them after they are through with their round. Then they will gladly go through any of the shots you may want.

If any of you—and I trust you do—plan to become sports photographers, I can promise you the pleasure of meeting a great many wonderful men and women and a great many very pleasant screwballs. And you'll meet, at least in my experience, very few whom you won't like.

You'll have your share of amusing experiences, too, and some not so amusing at the time but which seem laughable when you look back. I remember covering a yacht race a few summers ago and a photographer from another paper and I were put off on a breakwater a mile out for an hour of shooting the yachts from this fine vantage point.

We took our shots, then sat down to wait to be picked up. At first it was nice in the sun, then it became cloudy and finally it rained. We were soaked to the skin and our picture deadlines were long past.

At last, some six hours later, the official yacht which dropped us off came back. The apologetic yachtsmen aboard said they had forgotten all about us in the excitement of the race.

On occasion, too, you may have the chance to pose as an expert in some sport of which, actually, you know virtually nothing. I recall one afternoon at the Hawthorne race track near Chicago when a couple of determined women bettors insisted that I must have some inside dope on the outcome of the races. I told them that I didn't know anymore about it than they did, but they insisted so much that I finally marked their program for them, just to get rid of them. After the feature race, which happened to be the sixth on the card, they came over again and wanted to buy my dinner. Five of my first six choices came home winners, although I didn't have a nickel on any of them.

You're probably interested in knowing what your chances are of getting a job on one of the newspapers. I think that right now the field is crowded. But don't let that discourage you. Go out and keep on shooting pictures and if you have more on the ball than the other fellow your pictures will appear in print somewhere and make you a contact that way.

Well, I could write another thousand words, but I'll close with a plea that none of you listen to that old lie that a photographer is a reporter with his brains knocked out. A photographer, my friends, is a fellow who's too smart to carry all those big words around when he can get by with a little camera. In closing, here's wishing you all the luck in the world.

MR. FOOTBALL . . . by Wolf Lebovitz of the Chattanooga *Times*. From the 1950 Graflex Photo Contest.

News Photography

DAVID V. STICKLE

PREAKNESS START: Part of the daily stint during the lengthy Maryland racing season for WMAR-TV motion picture cameraman is coverage of the races. Each year, the full race of the Preakness is covered on 16mm film and shown on Television the same day. Twice this film, emanating from WMAR-TV, Baltimore, has been part of a special network telecast.

ARMY DAY: Using the WMAR-TV station wagon, a camera crew of The Sunpapers Television News records on motion picture film last year's Army Day parade.

PERHAPS the oldest television newsreel in the nation, the Sunpapers Television News, was born with the first formal program put on the air by WMAR-TV, Baltimore, Maryland, October 30, 1947. And since its birth, it has never missed a daily edition.

Its story has become an historical account of the people and happenings of its state—an account which draws the biggest television audience of any newsreel in the Baltimore-Washington area, a story which has been spun out on more than 240 miles of 16mm film.

On-the-spot film coverage of the fast-breaking event is the newsreel's life blood. But such coverage has always been guided by a sense of responsibility to the community, and, as a result, the Sunpapers Television News has consistently spurred the community interest. And, repeatedly, its features are a part of the CBS network daily newsreel.

The Baltimore television community of 300,000 set owners have come to know it as the program on which "they are most likely to see themselves," for it has presented more than 6,000 separate news items, ranging from strawberry festivals to speeches of the President.

Civic-minded organizations have come to know the Sunpapers Television News as a forum in which they can speak out for their charitable, religious and social work. And they have used it. For example, every recruiting drive of the Army, Navy, Marine Corps, Air Force, Army and Navy Nurse Corps, WAVES and WACS has been spearheaded by a public appeal on The News through the medium of sound-film produced in WMAR-TV's film studios.

To film this operation and bring it before the public with such great speed, the physical structure of the WMAR-TV newsreel department is outlined as follows:

MANPOWER: Three cameramen, two laboratory workers, two film editors, two script and news writers, one film director and news editor. Some of this personnel was trained in the news departments of The Sunpapers.

EQUIPMENT: 6 Bell & Howell Filmo Cameras, Models 70DF and 70DA; 2 Cine-Kodak Special Cameras; 1 Auricon-Pro Sound Camera, Model EM-71; 1 35mm Film Strip Camera, Zeiss-Voightlander; all necessary lenses, to include two Zoomars; 1 Houston Processor; 1 Bell & Howell Film Printer, Model J.

NEWS COVERAGE: Within the Sun Building, constant liaison is maintained between the newsreel director's desk and the city desks of the Morning Sun and The Evening Sun. It is an around-the-clock operation with cameramen on call 24 hours every day. Within seconds a major catastrophe or other fast-breaking news item is known to the newsreel department and a cameraman is on the way to the scene.

PROCESSING: Film is returned immediately to the film laboratory which is in the same building as the news rooms. It is processed, edited and cut at once. A system has been devised whereby the commentary is written while the film is being edited. Such speed enables the same news to be put on television the same day.

Here is an example: Last March a WMAR-TV cameraman went to Andrews Field in Washington, D. C., to cover the flight of four B-29's, which were turned over to the British as part of the U. S. program to help rearm Western Europe.

On film were recorded the pre-takeoff ceremonies in which Secretary Louis Johnson with Secretary Symington turned over the ships to Sir Oliver Franks, British Ambassador; plus the preparations of the crews and the takeoff.

The cameraman, with his footage, left by car for Baltimore at 4:30 PM, and the film was processed, edited and

*for Television**

FILM DIRECTOR, WMAR-TV, BALTIMORE SUN

an accompanying script written and cued in by 6:40 PM. Five minutes later it was telecast by WMAR-TV.

Easily the top sport in the Maryland area is horse racing. Film units of WMAR-TV cover the races at Pimlico, Laurel, Bowie, Harve de Grace, Timonium and the bel Air race tracks and have the races on the air for its sports-minded audience the same night. On WMAR-TV you can see the historic Preakness on the night of the day the race is run.

For that matter, sports coverage in the state on film during the past two years has ranged, literally, from chess to professional football and polo. Ranking high in popularity in this coverage have been the Naval Academy football games, the Baltimore Colts professional football games (All America conference), the University of Maryland football games, the Orioles baseball games (International League), and the Bullets professional basketball (Basketball Association of America).

High school and preparatory school sports have not been neglected and the role of sandlot baseball, organized in Baltimore by the Police Boys Clubs to combat juvenile delinquency, is a graphic part of summer scheduling of the Sunpapers Television News.

Easily the most rewarding pursuit of the newsgathering film department of WMAR-TV is the production of documentary films, aimed at stimulating the community mind.

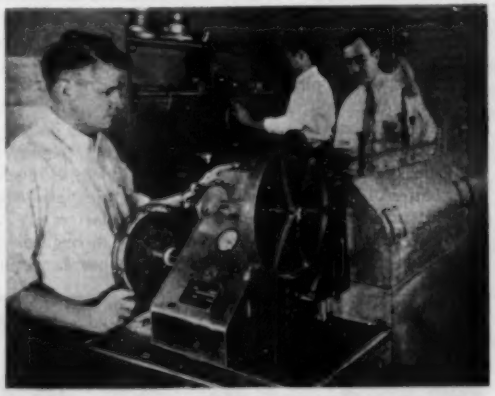
To this end, the film department is producing a weekly documentary film, 15 minutes long, in a series of 26, known on the television log as, "This is Baltimore."

Other documentaries, produced by the newsreel department included filming of the combined Army and Navy maneuvers off the Virginia Capes in "Operation Camid," and the first television film depicting the life of displaced persons in camps in Europe and their subsequent placement on Maryland farms in "Sanctuary for the Displaced."

In the past WMAR-TV has acquainted its audience with "The New Army" in a series of shorter film subjects made at the Armored School, Fort Knox, Kentucky, and Fort George G. Meade, The Edgewood Arsenal, and the Aberdeen Proving Ground. Within this series was the largest post-war armored maneuvers in the United States, filmed by a WMAR-TV newsreel film unit at Fort Knox.

It wasn't unusual for the WMAR-TV newsreel to have a complete report of an accident on the air by 7:3O PM the same day when the "Diplomat," crack B&O express, was wrecked at Laurel, Maryland, at 1 PM. In addition to the film coverage, from the air as well as from the ground, a sound-on-film eyewitness interview with a passenger on the train was incorporated in the report. And, the Baltimore and Ohio Railroad complimented WMAR-TV on the fair and dramatic television coverage of the smashup which killed one man and injured 37 other passengers.

FILM EDITORS: William Payne, left, chief film editor of WMAR-TV, and Axel Malashuk, cameraman, talk over a film sequence. The WMAR-TV film department uses three cutting tables constantly for editing and programming, utilizing all standard equipment.



LABORATORY: In the WMAR-TV film laboratory, technicians process 16mm film at the rate of one mile per week. Most of this film tells the daily news story of Baltimore, Maryland, and the Chesapeake Basin. In addition to this Houston processor, the laboratory is equipped with a Bell and Howell printer.

But these are isolated case histories in a newsreel argosy which now has encompassed more than 6,000 news stories. They tell nothing of the film story of children made happy by the opening of a new playground in a congested neighborhood; or how the Sunpapers Television News broadcast pictures and a description of two of the nation's most hardened criminals to help the FBI; or how a mother and father appeared before the newsreel sound camera to plead for the safe return of their kidnapped, four-year-old daughter.

These are part and parcel of the daily stint of the cameraman, writers and editors of The Sunpapers Television News—a television newsreel dedicated to public service, accuracy and integrity.

* Excerpts from a talk presented before the PSA Photo-Journalism Division, PSA Convention, 20 October 1950, Baltimore, Md.

Photographer or Camera

STANLEY E. KALISH

WHO TAKES the picture, the photographer or the camera?

That isn't a chicken-or-the-egg question at all, but one put seriously, and the answer too often is: the camera. At least the cameras of some photo-journalists. It seems that the practice of making the camera the instrument of photography has been forsaken by a good many photo-journalists. Instead, they have quit thinking out their pictures in their eagerness to show how clever photography has become.

It is hard to understand. Of all the kinds of photography that of photo-journalism should be the warmest and the most human. It is little concerned with composition as composition, or any of the other things that are important to the pictorialist. It is not concerned with being an art form. Rather, it is photography about the people, for the people—a photography that often is "off-the-hip," often high drama, often an inconsequential instant. But whatever it is, it is photography with its subject matter transcending all else. When the "technical" elements of a "good" picture are also included, so much the better, but camera journalism's pictures are not selected merely because they contain these factors.

For years, a major difference that has distinguished the photo-journalist from the pictorialist has been an uninhibited approach to photography. He ignored photographic convention. He seldom has used the mechanics of photography as anything more than mere tools for visually recording what is happening. He hasn't been bound by "rules" nor has he always striven for effect. He hasn't been a slave to dogmas and often has known only as much about the mechanical side of photography as is necessary to get his picture. His job has been to get story-telling pictures which bring a response (rouse an emotion) in a person who views the print or the published halftone.

Stan Kalish, widely known lecturer and writer, for ten years was picture editor of the Milwaukee *Journal*. He is shown holding picture at left. With him is Joe Costa (center). Both were in consultation with editors at the American Press Institute, Columbia University.

But something has been happening recently. The machine is mastering the man in too many cases. The camera, rather than the photographer, is taking the pictures. Many journalistic cameramen have subordinated thinking for stunting. They have become obsessed with demonstrating the wonderful devices of photography and their pictures are samples of the amazing things photography can do.

There is, for example, high speed photography. It is a wonderfully expressive medium when properly used, but currently it is often a mere demonstration of the camera's increasing cleverness. It is time to start thawing people from the grotesque postitions "strobe" freezes them in and to let them breathe again.

What has happened with "natural light" is another example. Natural light was around a long, long time and was used photographically a long, long time before it was suddenly "discovered" and exploited. It is time to return to using it as an expressive photographic device instead of almost always to create mood, mood, and more mood.

The voice will be raised that it is not the photographer who is at fault. It is the editor. Photographers, it will be maintained, are at the mercy of editors. Cameramen shoot what editors want and are enamored of, that photographic "style" often is done as the editor would have it. So "reform" must come in the editing side of photo-journalism. Which is indisputably true. But that argument relegates journalistic photography and photographers to the secondary role of being only instruments of someone else's thinking. The serious picture-making photo-journalist knows better. He knows that his photography can influence an editor's thinking just as an editor can affect his photographic approach. But in order to do this the photographer is going to have to quit making his subject matter props to show how smart lens and lights have become and turn his photography to recording the most fascinating of all things, the people and their accomplishments and failures.

The photographers of photo-journalism must realize this. It is time for them to begin to think how to turn all these tools into expressive photography that mirrors life—when to use flash, or "strobe," or natural light or any of the hundreds of gadgets so that people and things look natural in pictures. The camera journalists should think again what they are trying to show pictorially and then use the tools to express it.

It would be a good idea for the photo-journalist to expose himself to the pictorialist for argument and discussion. We may not agree with the pictorialist and what he does, but he knows what he is seeking. Which is more than most photo-journalists do.

The Free Lance

TOWNSEND GODSEY *

MOST PEOPLE consider the free lance as either a newspaperman out of a job or an adventurous odd ball. Actually, the term "free lance" did spring from the medieval mercenary or later, an unattached journalist. The degree of unattachment varies with the individual. In any event it is a case of one against the field

There is often little difference between a commercial photographer and a free lance, and as one begins to do free lance photography, the opportunity to do more and more strictly commercial work increases to a point where the photographer may find it necessary to make a decision as to which course to persue. Likewise, free lance work may attract editors to your kind of photography and result in an offer for a staff job. In this paper I am going to use the broad application to free lancing in order to show its possibilities and limitations and some of the factors which a photographer must consider if he is to be successful in his battle with the editorial lions.

However small this field of strictly free lance may be, there are countless opportunities for free lancing or selling whither-you-will for the staff magazine or newspaper photographer, the commercial studio operator, publicity or public relations worker, the company representative, field service agent and others who are alert and attune to life around them. Often these people find themselves in situations offering excellent possibilities for single pictures, and picture stories. These pictures may or may not unfold in routine work. One of my friends, who was shown the possibilities in the free lance field, is a biologist for a state conservation department. His Leicia is constantly with him and as a result he sells between $500 and $1,000 worth of free lance material annually. All the processing is done by this man and his wife in their kitchen.

Some newspapers have policies which prohibit staff men from selling pictures produced on routine assignments, but nearly all will allow staff men to do some free lance work. Magazine photographers, too, often encounter picture material that is outside the interest range of their publications and they are permitted to peddle their wares elsewhere. The alert commercial photographer likewise may see special picture possibilities and would be missing a bet if he didn't make the most of his opportunities. But he shouldn't give it away for a mere credit line. If he manages properly he can sell his pictures and receive his credit line, too. The commercial man also has an excellent opportunity to build up a stock file of prints on local subjects or posed studio stock shots.

Opportunities for the sale of pictures are definitely present. Editors are begging for fresh material. Some publications use staff produced material almost exclusively, but none would ever turn down a good picture or picture story that met their editorial requirements. Fortunately for the free lance, the fully staffed publications are in the minority. There are countless general interest publications, trade papers and house or religious organs which do not have a single staff photographer but who buy all of their material from agents or free lance photographers.

First, the free lance does not always have the prestige of a staff photographer and must use more tact and imagination in producing his stories. For instance, one of the first things a picture subject is likely to ask is "In what magazine is this going to be used?" A staff man would have a direct answer while the free lance would have to explain that he wasn't certain (unless, of course, he was working on a definite assignment). In such circumstances the free lance might have more difficulty in getting the cooperation necessary.

The Cost Factor

This situation also brings up the cost of producing a story. The staffer would have at least some sort of expense account but often the free lancer isn't even compensated for his expenses when the pictures are purchased as a package job. This considerably limits the kind of thing the free lance can afford to undertake. A staffer can spend weeks on a story for his publication, travel great distances, pay model fees, furnish gifts to the natives that would add up to many times the amount a free lance would receive on the same story if he worked it up on his own. This is a bitter but important fact to face but it shouldn't discourage anyone who wants to free lance their work.

Likewise, for the sake of the development of photography as a communication form, it is a good thing. It makes the free lance work close to home, become conscious of the life immediately around him, exhaust every possible angle of a picture story and find every possible market for it. It has this great advantage in its shortcomings. It gives you an opportunity to become an authority on a certain region, its products, industry and

TOWNSEND GODSEY

Photo by F. Quellmalz, Jr.

* Author of two photographic books ("Free-Lance Photography" and "A Guide to Photographic Control"), Mr. Godsey is well known as a lecturer, writer and cameraman. Now holding forth in the Missouri Ozarks, he formerly was publicity photographer at Stephens College, Columbia, Mo., and later served on the staff at Fred Archer's School before returning to his beloved Ozark hills. He is a member of The American Society of Magazine Photographers.

above all—its people. A staff man who never gets beyond the Hudson River without flying can never have the opportunity to develop the understanding and sympathy you have for your own home community.

The camera is a tool. What you do with it depends entirely upon you. And what you do with it as a tool depends upon your concept of photography, your philosophy about pictures and picture material. What the photographic world needs is not a new $500 camera but some million dollar ideas. We've put too much emphasis on our camera equipment and not enough on our mental equipment. In other terms we need to think photographically. We shouldn't be too discouraged, I suppose, because it has taken thousands of years to develop the form of communication we call writing, and we've made some progress in the first hundred years of this new form of communication called photography. What a fortune could be made if someone could just sell packaged ideas like we do the packaged developers of film! Or flash bulbs.

We spend much time and energy learning about cameras, gadgets, formulas, and techniques and ignore imagination and ideas. Creative imagination is not a special possession of genius but something everyone possesses. Our senses are closely related to the imagination. Through them we are able to bring absent objects and perceptions forcibly to the mind and if you imagine powerfully enough you may be able to express something new, impressive, artistic. Selecting and expressing through picture ideas derived from observation and memory thus results in a new kind of creativeness.

People are interested in pictures that make impressions upon them, and if you analyze an illustration that make an impression upon you or creates a feeling within you, you will doubtless find that it appeals to one or more of your senses. We all make a lot of smellies but why shouldn't our photographs actually carry with them the odors of their subjects? I believe they will some day. A lavendar and old lace scented developer for pictures of old ladies; a fatal apple perfume for the portrait of a sweet young thing, etc.

Which brings up the subject of where to get ideas. Have you ever noticed how much imagination goes into the perfume ads in slick fashion magazines? And all the manufacturers have to sell that a skunk doesn't have is romance! But they do a superb job of utilizing the imagination and the senses.

Editors say, "Write as you feel." Why not photograph as you feel? But first feel. How many of us know the feel of mashed potatoes? But you did when you were a child until someone said, "Darling, please learn to keep your hands out of your food. Use this pretty spoon." And you did use the spoon lest you be punished. When you went to school or church your emotions were further repressed. And now that you are photographers you wonder why, when you see a subject, that you don't *feel* it as a picture. Naturally, one must have some dicipline over ones emotions but the repressed individual can only be fair game for the psychiatrist if he tries to make pictures that will appeal to an editor.

Solomon would have made a good photographer—after he had petitioned for an understanding heart. And in developing a philosophy of photography one does need an understanding heart. Not maudelin sympathy but complete understanding of the kind that will permit a viewer of your pictures to feel the feelings of the subject. Naturally, as a free lance you are interested in the monetary compensation that must be derived from the sale of your pictures. But the big "S" in the dollar sign implies service, too. Many an understanding picture or picture series has enabled the photographer to give a boost to a cause, the hopes or ambitions of the subject.

Every community in America is in need of men and women—including photographers—who will use their talents for community betterment. A community awareness of its needs and advantages can often be furthered through understanding pictures which a free lance can provide.

But you say, I'm getting off my subject. And you want to know how to make money with your camera. If you must be mercenary, and who isn't to at least a point, I still say you can sell such pictures. Right now, for example, editors are seeking pictures of science as applied to everyday life, education, individual and group cooperative projects, home and the family, religion in action. Some of my most profitable picture series have been a result of an interest in the little guy. Pictures helped Ted Richmond get needed public attention to his 10,000 volume library in the Buffalo River country of the Ozarks yet I have already made nearly $300 off that one project; Guy Howard, the Walking Preacher of the Ozarks, received his first national attention through pictures; he made some $15,000 off his book about his work in the back hills, I made some $1,700; Don Gallagher, an isolated wood carver found a market for his carvings, I made nearly $100. So you see it does even pay cash to have a feeling about the little fellow whether he's the neighbor next door or a native in Timbucktoo.

Not all of the money to be made from free lance work comes directly from the sale of pictures for newspapers and slick paper periodicals. There are many other ways of cashing in on this material through the sale of pictures to house organs, trade papers, newspapers, book publishers, advertising art, state and federal agency publications, syndicates, calendar makers, foreign publishers, museums and libraries. The trick is to be not satisfied with a single sale but by analyzing your picture decide who might be interested in seeing it and then trying to sell it to the prospect.

The initial sale of a picture will barely more than pay the cost of making it. Therefore, the more sales the better. Your pictures become a working capital and you can, through developing a negative file, build a fat income producing stock. From this file you can, from time to time, draw for single pictures or through combination of pictures from many different sets often build up new and seemingly new picture stories. Again it's a matter of ideas. Or as some folks say, knowing the angles. You learn these through experience and constant study of publications to see the trends.

It isn't always easy to cash in on news, excepting as the news represents trends. Much of the excitment and adventure is to be had in spot news free lancing but there is little to be made at it excepting for the staff man who has a subsidy in the form of a regular pay check. There is nothing so dead as a second day old newspaper and

newspictures, even the great ones, often are in this same category. Therefore, the free lance must aim to do an occasional newspicture as a matter of service to a feature picture to bring in the free lance checks.

And all this brings us right back to our contention that it is ideas that count in the free lance business. The mind and not the camera limits what we can do in this field. This is a field in which the possible is not limited to the known.

When photographers as a group realize the necessity of a oneness with good techniques and accept photography for photography's sake the critics will cease to say, as did George Bernard Shaw, that "there is nothing wrong with photography but the pictures." Instead of confusing ourselves and creating new photographic frustrations with technical problems which should be reserved for photo bull sessions, what we need to do is to let the light of understanding into the darkroom.

The Flash Gun Does Not Belong on the Camera

GIFF HAMPSHIRE *

FLASH-ON-THE-CAMERA photography is responsible for more hairpulling, and more poor halftone reproductions than any other variable in the process of getting pictures into print.

Instead of being used as it should, it too often is the lazy man's substitute. Most of the time other lighting techniques would make the paper sparkle with good halftones.

A majority of editors, and many photographers, have only a vague idea of what type of photo copy makes for good reproduction. They've heard it should be "contrasty." This is only half true. A better description is that the copy should consist of "a good distribution of contrasty tones." In such a photo, the facial features would be clearly defined by a series of shadows and highlights.

The term "contrasty" can be applied to a photo taken with the flash on the camera because there are large areas of black and white. Yet, nearly all facial features and other details are "washed out."

* Fairchild Camera and Instrument Corporation.

Back in the days of rough-and-tumble press photography, the invention of the flash bulb and synchronizer was a great boon to metropolitan photographers who had to "grab" their shots and run to the next assignment. It was an invention mothered by the necessity of shooting under inadequate lighting conditions. The flash gun was mounted on the camera for greater mobility.

Examining this raw era of journalism, one can easily assume that another reason for the camera-gun association was to leave the photographer's strongest arm free to elbow colleagues out of the way.

In our modern phase of photo-journalism neither of these reasons can justify flashguns being mounted on cameras. The average newspaper assignment is routine. The photographer spends an hour or so getting to and from the scene. He doesn't barge in, but waits until the subject has combed, coated, and mirrored. Minutes pass while he poses, and often he poses and reshoots. Today, he doesn't worry about other photographers. If there are any in the vicinity, they wait their turn like gentlemen of the press. But, many photographers still do not take the extra few minutes to set up an extension light.

Flash-on-the-camera lighting reduces modeling and washes out facial detail. Here, face is predominately one-tone. No shadows separate features.

Removing flash and holding it high, gives shadows under facial features. Here, shadows are purposely too long to emphasize technique. One light was used.

Combining technique of first two photos, the cameraman uses two lights. Camera flash was used to "fill in" and exposure was for main light high above.

It is difficult to understand the failure to use multiple lighting because any professional is adept at the technique, and he is constantly faced with examples of its benefits.

However, there are three main excuses: Foremost is the cry that carrying and manipulating the extra light or lights takes too much time and effort.

Next comes the complaint that editors won't pay for extra bulbs.

And, finally, photographers also often take the easy way out.

None of these excuses is valid.

The newspaper is, or should be, interested in good halftone reproduction, and that begins with the photograph. Only well lighted photos with a good distribution of contrasty tones insure good halftone reproduction. Flat lighting will not render these tones. Off-the-camera or multiple lighting will. Therefore, editors and photographers should outlaw flash-on-the-camera technique—reserving it for the one purpose which it best serves—as fill-in in synchro-sunlight.

Cast Shadows

The finest example of lighting for good reproduction is a photograph taken in sunlight when the nose casts a shadow falling short of touching the upper lip line. Examination of the photo will reveal that shadows also underline the brow, lips, and jaw. These shadows make up the distribution of contrasty tones which are necessary for good reproduction. Visualize the same face pictured at night from behind automobile headlights. No shadows would form because the light rays strike directly "filling-in" all features, just as flash-on-the-camera lighting.

Multiple or off-the-camera lighting stimulates natural lighting. The photographer attempts to place the main source of light so that the shadows will underline important features. He may accomplish this with one, two, three or more lights, depending on distance and the number of objects to be photographed.

The "mug" or head and shoulders shots make up a large portion of news assignments, and this subject can be well illuminated with one or two lights. The photographer is usually close to his subject, within six feet, and by removing his flash gun from the camera and holding it at arm's length directed at the subject's chin, the brow, nose, lips, and jaw will cast small shadows outlining these features. Thus modelling becomes apparent, and a better picture results.

If the photographer wishes, he may leave the flashgun on the camera using an extension light as his main source. In this manner, the extra light is positioned on a stand so that it points at the chin. The photographer depends on this light to cast the shadows so his exposure is keyed to it and the flat light is subdued to throw weak rays into the shadows. If the flat light is of equal strength, the shadows will be washed out and the photographer is back where he started—with no distribution of contrasty tones.

Lighting for Groups

Another frequent photo assignment is the picturing of a small group of people. When the photographer is six to twelve feet from the subject matter, as he is in shooting small groups, it is impossible to utilize the flash gun for the main light source because he cannot position it properly. If he wants to use only one light, he must use the extension light on a stand aiming it down to underline the features of the most important subjects. Because the one light has to cover larger areas, larger shadows will be cast and it is desirable to lighten these shadows to show some detail with the flash gun on the camera.

Occasionally, the photographer is assigned to picture a large group of people or make other "long shots." The same basic lighting principle applies, but more lights are necessary. The main lights are still placed high and are aimed down to cast good shadows, but the position of the various main lights is governed by the number of subjects. As a rule of thumb, the photographer can use one main light for each five to eight subjects keeping the light stands out of the picture and yet illuminating all subjects evenly. There are many techniques for lighting large areas, but the main light source must be placed so that its rays come from above and form interesting and pleasing shadows.

Background Separation

Besides basic off-the-camera or multiple lighting technique for copy with a good distribution of contrasty tones there are other lighting tricks which will insure good reproduction. The most valuable of these is "rim" or back lighting. This is the practice of placing an extra light high and behind the subject and close enough so that the hairline, shoulders, etc., will be separated from a dark background by a rim of bright light. This guarantees good separation in the reproduction and it further illustrates the term "distribution of contrasty tones."

Two types of subjects often give the photographer special lighting problems. The dark subject against the dark background, and the light against light backround.

Of course, it is best to change background, but this is not always possible. The first problem can best be solved by employing the backlighting technique, or if the subject is close to a solid dark background, an extra light can be directed at the part directly behind the subject. If the photographer can use only two lights, then his main light should also illuminate the background.

When lighting the white subject against the white background, the subject should be moved far enough from the background so that the main light will fall off enough to make the background appear grey in the photo. To control shadows in the white subject it is best to abandon the fill-in light because many of the main light's rays will be reflected into the shadows.

If the photographer exercises good lighting technique, his pictures will always consist of a maximum of contrasty tones possible from the subject matter. A retouch artist can usually improve any photograph, but good reproduction is possible without this step.

Halftone reproduction starts with the photograph—there can be no egg-chicken or chicken-egg debate about this fact. Editors and photographers would do well to study those photographs for reproduction. If it lacks the necessary good distribution of contrasty tones, the blame can be put on single-flash-on-the-camera lighting.

Photographic Group Approaches National Maturity

KEN MCLAUGHLIN *

PRESIDENT, NATIONAL PRESS PHOTOGRAPHERS ASSN.

NEWS cameramen are now wired for sound!

The sound . . . a national voice all their own . . . is provided by the National Press Photographers Association, Inc.

There is plenty of evidence that this voice is being heard all over the land, and that when it speaks on behalf of press photographers, it gets immediate attention.

The NPPA voice, used with restraint and dignity, but always with insistence, is getting action at the national level for all news cameramen. As a result, the prestige and professional standing of press photographers has risen everywhere.

The organization began developing immediately after the end of World War II.

Many cities had local press photographers associations that were doing valuable jobs for members. But the need for a national association of *all* press photographers working in concert, had long been needed.

Burt Williams, of Pittsburgh, took the first steps to establish the National Press Photographers Association. He journeyed to New York and sought the counsel of Joseph Costa, APSA, and others who had been active in the New York Association. They immediately realized the tremendous help a national group could be, but they also recognized the problems confronting them, in organization.

What would be the reaction of press photographers and newsreelmen in all areas of the country? Would they unite for their common welfare? This was not to be an organization in the union sense of the word . . . where the member might expect to see results, in his pay check. In fact, the contemplated constitution was to stipulate that the Association would never indulge in labor union activities.

The first attempt to determine the feasibility of organization was a dramatic ten point nationwide telephone hookup. Leaders in various sections talked together, expressed their views and all agreed that press photographers, a notorius breed of rugged individuals, would work hand in hand to improve and elevate their craft.

In the summer of 1946, as a direct outgrowth of the telephone hookup, a number of progressive, clear thinking photographers gathered in Atlantic City to approve a constitution and set of by-laws, and thus NPPA was born.

At that first meeting Joseph Costa was chosen president. Burt Williams became secretary and Charles Mack, newsreelman of Washington, D. C., was elected treasurer.

Member of the Sprague Memorial Awards committee is hard working Don Mohler of the General Electric Company. Here Don is shown with the coveted trophy given annually to stimulate greater effort in the craft. Photo by J. Winton Lemen.

The country was divided into ten regions with a vice president for each. Unique in this setup was the fact that no officer could receive any pay for the many hours he must devote to the duties of his office. Another feature of NPPA that has continued from its inception is the absence of factions or domination by any area. The presidency, for example, has moved from New York (Joseph Costa) to Wichita, Kansas (Paul Threlfall), to San Francisco (Kenneth McLaughlin). All officers must be actively engaged in press photography or newsreel operation. The membership does include men in fields allied to our branch of photography but they are "associates" who do not vote.

From that initial session, the membership has grown amazingly. Every state, Hawaii and Canada are represented on the membership rolls. Each day finds more press photographers swelling the NPPA ranks.

What is behind the desire of press photographers to belong to and support a national association of their own? Why should Joseph Q. Doaks on the small daily in Four Corners want to be a part of this movement?

In the history of newspaperdom, the photographer is comparatively a Johnny-come-lately. A few hidebound purveyors of the written word resented his coming, and to this day, despite photography's undisputed place in the recording of everyday history, some resentment still exists. Unfortunately, cumbersome equipment and a few "characters" added fuel to fires of resentment, not

* San Francisco *Chronicle*.

The three presidents—past and present—of the National Press Photographers Association. Holding the "at last" sign and the "Complete Book of Press Photography" is Joe Costa, King Features, Chairman of the Board, who served as first president. At his left is Paul Threlfall, the Wichita *Beacon*, second president. At the right is Ken McLaughlin, San Francisco *Chronicle*, who now holds the office.

only in the industry but with the general public as well.

Most of the courtrooms of America reflected this attitude for a long time, by excluding press photographers. Today, however, in more and more enlightened courts of law where news cameramen are allowed to operate, you will see neat men, working quietly and efficiently, with no impairment of the "dignity of the court." The courtroom issue most dramatically portrays the resentment to photographers but it lives yet in many places. The Association, through the continuing efforts of its members, is breaking down barriers along the line.

Often times resentment takes a physical turn and bodily injury is done or expensive equipment smashed. Reports of such actions used to be limited to the immediate vicinity of the assault. Now through the Association's monthly magazine, the *National Press Photographer*, we are learning that more adequate laws are needed to protect news photographers (reporters, too) and the Association is working to that end. Already New York and New Jersey have enacted special laws to protect the press cameramen from vengeful subjects while the photographer is making pictures. Simple assault and battery charges are not enough. Other state legislatures are contemplating similar laws due to our urging.

The press photographer is naturally interested in the improvement of the tools of his profession to make better pictures and thus serve the public and his employer better. The Technical Committee keeps Mr. Doaks informed on all of the latest developments. Meanwhile, if he has the opportunity, he may attend one of the short courses held at various universities, in conjunction with NPPA's Educational program. At these short courses, instructors and professionals of national repute give him knowledge that he might never otherwise acquire.

Each year NPPA conducts a Photo Contest to enable Mr. Doaks and Mr. Big Town an opportunity to display their best pictures on an equal basis at the national level. Of course, there are several other contests, all of them good, honestly handled, welcomed by our membership, and the Association always urges its members to participate in them. But somehow I feel that winning the NPPA Contest is the highest accolade, as it bestows the unofficial title of "Photographers' Photographer." The Association has evolved a point system, now generally accepted in contest judging, that affords Mr. Doaks an equal chance with Mr. Big Town. First place in 1950 went to Billy McMillan of Kosciusko, Mississippi, a town of 3,000 population.

Should our mythical man from Four Corners find himself in a big city on an assignment or vacation he would find there fellow members ready to lend a helping hand. Common membership in an organization trying to improve the craft tends to cement the natural bond of men working with cameras.

The ideals of the NPPA are not the only attraction for Doaks and his fellow craftsmen. They know when they joined that NPPA was not going to increase their pay or shorten their hours or secure their jobs; the top ranking photographers, the men most secure in their employment, were among the first to become members. They joined primarily for the ideals of the Association, for the self satisfaction of professional achievement and recognition. And while we have no intention and are constitutionally prohibited from union activity, we know that in the very near future the Association will be able to provide the membership with many additional professional benefits.

Two years ago the Sprague Awards were instituted. Named in memory of Joseph A. Sprague, of Graflex, the highly coveted awards are given to members for achieve-

ment in photography and to non-members for their advancement of press photography.

Fellowships, and last year, Merit Awards, for "outstanding service to photography," were given.

Honored holders of the Sprague Awards include Dr. Harold E. Edgerton, FPSA, Massachusetts Institute of Technology; George Yates, Des Moines; Ernest Sisto, New York; Joseph Costa, New York; Henry R. Luce, editor in chief of *Life*; Kent Cooper of the Associated Press; Frank Scherschel, *Life*, and William C. Eckenberg, New York *Times*.

One of the examples of NPPA teamwork was the production of "The Complete Book of Press Photography," hailed by critics as the finest volume on the subject ever printed. This was the result of the combined efforts of many members and friends of NPPA over a period of two and a half years. Editor Joseph Costa and his assistants have been rewarded in part by the many letters of commendation from the readers of the book.

We are still a young group and our national voice is not yet as strong as it will be when we have attained our full maturity. That day is rapidly approaching.

The Functions of NPPA Educational and Technical Committee

WILLIAM C. ECKENBERG *

JUST a few years ago the National Press Photographers Association created the Educational and Technical Committee. The objective of this group is to foster the dissemination of practical knowledge, techniques and high professional standards to working press photographers and to students who aspire to become photo-journalists. This Committee was also created to cooperate with schools and colleges and is composed of a distinguished group of men in the field of press photography.

Members of the committee are Professor William Taylor, Chairman of the School of Journalism, Kent State University and committee secretary; J. Winton Lemen, of the Eastman Kodak Company; Don Mohler, APSA, of the General Electric Company; Robin Garland, of the Graflex Corporation; William H. Fritz, National Carbon Company; Hy Schwartz of the Kalart Company; Gordon Kuster, APSA, Director of Photography, Columbus (Ohio) *Dispatch;* George Yates, Des Moines *Register & Tribune;* Charles Mack, MGM Newsreel Corporation; Professor Clifton C. Edom, APSA, School of Journalism, University of Missouri; Professor Truman Pouncey, School of Journalism, University of Houston; and the writer, who serves as chairman.

The NPPA Educational and Technical Committee is working toward the time when it will be able to provide such assistance as may be desired by the teachers of journalism. It hopes to be able to consult with them on request in planning their courses of study as they affect photo-journalism.

A survey by the committee revealed that only a few colleges are now including short courses in press photography in their journalistic curricula. A leader in this field is Kent State University. The 10th Annual Short Course in Press Photography has just been held in March. Working press photographers have come from all over the United States as well as Canada to take part in these four day clinics.

The pioneering of the Short Course at Kent was helpful to the Educational Committee in the development of its Press Photography Short Course Manual, which was prepared for use by local press photographers associations and other qualified professional groups who wish to sponsor press photography educational courses. The Manual describes the ways and means to organize and present such courses, taking the methods to be used step by step.

In April of 1950 a most successful "first time" Short Course in Press Photography was held at the University of North Carolina. The combined efforts of the North Carolina Press Photographers Association, the NPPA Educational and Technical Committee and the North Carolina Press Association assured its success. The course was attended by 140 cameramen from 10 southern states and terminated with a profit. Plans are now under way for a second short course by the Carolina group this Spring.

The National Press Photographers Association, as a body of professional news photographers representing in their daily work the leading newspapers and photo wirephoto services of America, is extremely interested in improving the general standards of photo journalism. It has a great interest in the calibre and course content of instruction given to students planning such a career. It recognizes the importance of proper accreditation of Schools of Journalism, especially those including press photography. Such a program is in progress and the accrediting is being done by the American Council of Education for Journalism, in conjunction with the American Newspaper Publishers Association, the Inland Press Association and others. The accrediting is being done, not by schools but by sequences. One school may teach editorial work alone, another radio, while another might teach press photography.

The NPPA, through the Educational and Technical Committee, is willing and anxious to cooperate in every way to assist and even work on any committees or bodies that function for accreditation of such photography sequences.

* Chairman of Committee; Staff Photographer, New York *Times;* Assistant Professor, Graduate School, Columbia University.

Concept, Birth, Development and Manufacture of a New Product

BOB GARLAND *

How MANY times have you heard, "I thought up that idea . . ." or ". . . the suggestion for that innovation was passed along umpty-ump years ago?"

Both as a working photographer and technician, such statements frequently have amazed and amused me.

The fact that some existing equipment could be bettered or new equipment could be manufactured seems to call for some folks to remember a dream or a thought they once had concerning just that item . . . it hardly constitutes the claim of origination of the finished product.

Years ago photographers saw Graflex-made magazines for studio cameras and other adaptions of a changing septum design to handle sheet films. During the last war I saw a device which I was given to understand, was originally designed and made in Belgium. Numerous and sundry holders have been designed and built all over the world. Some had limited advantages; many were incapable of modification for cameras commonly used.

Now let's consider a new product . . . its concept, birth, development and manufacture.

In the fall of 1947 a New York photographer, John D. Wilson, appeared at the Graflex Inc., New York branch office. With him he carried a 3¼ x 4¼ sheet film magazine. Mr. Wilson had thought out a way and means of building this model and felt it offered some manufacturer a potential product. (See Fig. 1 and 2 which show the Wilson Magazine in 3¼ x 4¼ size, both front and rear opened up.)

Wilson's magazine, as it was promptly labelled and shall be referred to in this article, had a combination of many advantages that had not been apparent in other magazines.

Manufacturers are forever conscious of the costs of development, improvement of design, tooling and building an item. They must gamble on whether the new item offers enough advantages to be worth the investment it ties up in salaries, time and costs. And the cost of the item to the potential consumer has much to do with its acceptance.

The Wilson magazine offered a better and quicker way to expose sheet film, yet it was heavy, brass bound, and had two slides to manipulate. It did not show how many septums had been exposed, it could be pulled loose from the back of the camera, and after use it gave indication that it might fog film. Nevertheless, John Wilson had found a new and better way of shifting film loaded septums in his magazine. An agreement was worked out with Wilson whereby Graflex designers and engineers would take his idea and actual model and attempt to develop it into an item that could be manufactured and used by photographers.

Graflex designers are a working team. When they start on a project they consult members of the concern that work with the cameramen. What might seem entirely plausible to the engineers could be quite objectionable to a working photographer. On the other hand, many people who use the cameras are not mechanically adept, nor are they as conscious of the mechanics of a piece of equipment.

That was the case in the winter of '47–'48 when we settled on the Wilson magazine. The 3¼ x 4¼ film is popular and many cameras use that size holder. On the other hand, Graflex had a new 2¼ x 3¼ camera in the design-development stage. It seemed logical to adapt Wilson's magazine to the new camera . . . the 23 Century Graphic with Graflok back. A small compact holder that worked well with the new camera would offer a proving ground in the smaller size and further would test it from an acceptability standpoint.

The Wilson magazine had two slides to operate. How could it be operated with one permanently attached slide? The Wilson holder did not number the septums. How should the improved holder be designed to indicate which septum was in the exposed position? Suppose the user wanted to shoot one or two pictures? How could he know that he had a certain number left? How many exposures would the user want? Four, six, eight, ten or

* Director, Photo-Journalism Division, Graflex Inc.; Program Chairman, PSA Photo-Journalism Division.

Fig. 1

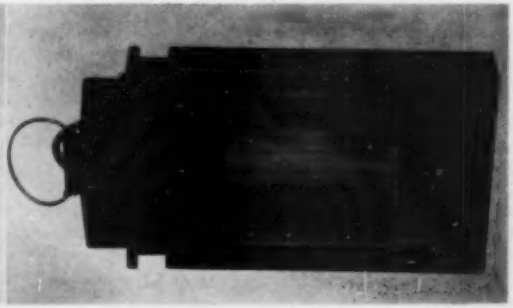


Fig. 2

twelve? How could he know that he wouldn't double expose? Was there any way to tell when he had the film covered in the holder or ready for exposure? What would keep the user, under duress, from yanking the holder out of the back of the camera? Before the designers and engineers even started, these were some of the problems that existed.

The designers spent hundreds of hours eliminating contradictions in specifications, and in searching for the best and newest materials that would withstand shock, maintain tolerances, stand wear.

Almost a year after the Wilson holder was taken into the company's operations program, the first hand-made 23 Grafmatic holder was placed in my hands for testing. Figure 3 shows this experimental model.

I received a personal thrill out of loading, shooting, and, like all photographers, seeing what kind of negatives the new holder would produce. As a camera user I was perfectly willing to give the new holder a full green light. To quote Joe Costa (who recently returned from Japan where he used six of the latest of these small Grafmatics while shooting color for the New York Sunday *Mirror* Magazine) . . . "it's terrific!" However, that Grafmatic 2¼ x 3¼ was no where near the finished stage.

The monitor model was shown to a select group of working photographers and their immediate reaction was ". . . fine, how soon can we have a larger 4 x 5 model?" Some of the cameramen gave definite suggestions but our conference records at Graflex show that these same suggestions had already been made.

Actually it took from the fall of 1947 until March 1950 before Graflex felt they could announce and show a finished, tested and operating 2¼ x 3¼ Grafmatic holder that with few instructions, could be used by the average camera owner.

The 23 Grafmatic (See Fig. 4) is a six septum sheet film loaded holder with one permanently attached slide and two interlocked compartments that enable the user to isolate one septum at a time by drawing out and re-inserting a handle attached to the slide. The next step is to draw both slide handle and one compartment out and replace it. This automatically drops the exposed septum to the bottom of the stack and by again pulling out and pushing the slide back into the holder you have the next septum in position. An automatic numbering device and an indicator built into the holder tells at all times whether a septum is ready for exposure or is covered and ready for removal from the back of the camera.

The holder was accepted and bought by small camera users but work was pushed on the "45" Grafmatic (See Fig. 5), which is now in manufacture.

The "45" Grafmatic has an improved locking device which visibly and by touch indicates whether the septums are exposed, the holder locked, closed, loaded or unloaded . . . as the case may be. There is also a unique device that numbers each exposure and tells which septum you are exposing. Both holders automatically lock closed when six exposures have been made.

Here is an example of a cameraman taking an idea and giving it birth in a working model. Many may have thought of the idea, but few have done anything about it. Even with Wilson's work it still took years and a large staff of experts to make the Grafmatic holders an actuality.

Don't be discouraged when you have an idea for a new piece of equipment and have tangible evidence of why and how it will operate. Go to a competent manufacturer and you, too, may be the instigator of a new advance in photography.

Country Editor with a Camera May Be Ahead of Procession

From the Kansas City Times

Bethany, Mo.—It was a busy day, when the country editor (and staff photographer) had so many things to get done that he couldn't see the way through them all.

But a new camera just had arrived in the mail, and as he had been hanging around the postoffice after each train for days, hoping the camera would arrive, he just had to throw things down and pause long enough to slit the parcel post package open for a quick look.

Persons were coming and going, and occasionally the telephone rang. Up stepped one of the callers, for his turn he had awaited. A brisk-moving, heads-up individual, who obviously could take in a situation at a glance. He was not there to waste anybody's time. He stated his name, said he was an encyclopedia salesman, and asked the country editor whether he would be interested in a new set of encyclopedias for office use. Nope, said the editor, didn't believe so, right now. (Business of turning the camera around, trying to learn how it was opened.)

"What do you do when you want reference?" asked the salesman, after he looked about and saw no encyclopedias, but a lot of books on how to use the written word.

Fig. 3

Fig. 4

Fig. 5

TRAPPED . . . by Russell Reed, Oakland (Calif.) *Tribune*. First prize in NPPA's Annual Contest.

"Try to look it up in a set some years old, at home."

"What edition is it? Does it have monthly renewals?"

"No, I don't recall the edition. It's some years back."

"What do you do if you can't find what you want in it?"

There the editor made a mistake. By that time he had the new camera open and was examining this and that doodad and thingumbob, all of them interesting. He thought he would give the salesman the brush-off, and he replied:

"Well, I try to look it up over at school." He should have mentioned the public library, too; if the information is not contained there, either, he cancels off the whole deal. It probably won't save the world, anyhow.

"The school doesn't have a modern set," shot back the salesman, in triumph mixed with scorn. "In fact,"—and there his choler began to rise perceptibly—"They tell me they don't read to amount to anything."

That was a bit ambiguous, but the editor gathered that it was meant the students don't read much.

"Did they tell you that over here at this school?"

"No, but they tell it to me about everywhere I go. They've gone in for pictures—lots of pictures. They've heard that old Chinese blurb that one picture is worth a thousand words, and they've gone for it; swallowed it whole. It never was true, but they quote it to you.

"Some teachers, I think, are too lazy to try to impart knowledge by word and thought, so they like to take the picture way out."

The phone rang. The office had begun to fill up again with other persons. The editor lifted up the telephone to answer the call, and waved to the salesman to stick around. The man was gettting interesting. But he didn't wait. Opening the door to leave, he pointed back to the camera and said:

"You'd better get good with a camera. That's all they'll be able to read and understand twenty years from now—pictures!"

The Story Behind the Famous Flag Raising Picture

Was Joe Rosenthal's famous Flag Raising picture the first taken on Iwo? Was the picture posed? When famous news pictures come up for discussion, those questions continue to be kicked around. They were settled, however, to the complete satisfaction of a number of journalism students at the University of Missouri when Joe addressed the group a couple of years ago. Said he:

". . . I heard a patrol was going to place a flag on Mt. Suribachi. I said phooey. But I checked and found we had really secured the hill. That meant that the marines on the southern part of the isle were fairly well secured. I was impressed because I felt it was the turn in the tide of the battle. The patrol had gone up about a half hour before. I found them fooling around with a metal pole, and found that they were going to put up a flag *and keep the first one as a souvenir*.

"The best spot from which to shoot the picture was about ten feet out over the water. I did the next best thing and found some sand bags, empty cartridge boxes, etc., and built up the slope on which I, already built too close to the ground, was standing.

"To save your asking the question that is always asked—*I did not pose the picture*. I didn't tell the men where to place the flag. The picture is manufactured by them. I was merely a spectator there to take the picture. About 85 per cent of picture taking is being where the action is. When they raised the flag I took the picture. I thought it was pretty important at the time, so I called upon these men, once the flag was up, to cheer so I could take their picture, but they were tired and busy throwing grenades into foxholes, etc., and weren't too anxious to pose. I had to kid them along and finally got about 18 or 20 of them around to make a picture. I saw that these negatives got to the command ship.

"Two days later word caught up with me—'Congratulations on the flag raising picture.' I thought, 'It just goes to show that if you want a good picture you have to work for it.' I didn't see the real flag raising picture until after you did, and then I saw that it was a good picture, too. For the first time I agreed with an editor over a picture. What it meant to me was what it meant behind the lines—what it meant to the men. I'd be lying if I didn't say I was proud of it, but I mean it because it reflects what the war was. It reflects the correspondents and fighting men who gave their lives and didn't come back and whom I knew well."

PSA PHOTO-JOURNALISM DIVISION

A cordial invitation is extended to all PSA members to affiliate with the PSA Photo-Journalism Division. The advantages are many, foremost among which might be mentioned the free receipt each month of the "National Press Photographer," the official magazine of the National Press Photographers Association, the quarterly News Bulletin, the photo-journalism portfolio, and advice and help on free lancing and photo-journalism problems. Choose the P-J Division when paying your dues or send $1.00 to Headquarters.

THE FOLIO Volume 4, Number 4

Devoted to News of the Pictorial Division of the Photographic Society of America

Introducing — Our New Name

In the October issue of *The Folio* we announced a contest to choose a new name, a name which we hoped would be more descriptive of this section of the JOURNAL, which provides news and information about the various services offered by the Pictorial Division for its members.

We have chosen the new name—it is the PICTORIAL DIGEST. This name was chosen by a committee composed of the Chairman, Vice-Chairman and Secretary-Treasurer of the Pictorial Division, together with Ye Editor.

This suggestion was one of the first received, and was submitted by Henry E. McKay, of 152 Prospect Park West, Brooklyn 15, New York. To Mr. McKay our sincere thanks for his fine suggestion—and, of course, a year's dues in PSA and the PD.

In making his suggestion he wrote, "I believe the name should be one which not only retains the same initials as the Pictorial Division, but also describes the bulletin as exactly what it is—a digest of the news of the PD. Therefore the name should imply that it is a digest and concerns pictorial photography."

In submitting the suggestions to the officers for selection, they were first arranged in a random order, not necessarily in the order in which they were received, and numbered. A set of numbered slips was prepared, thoroughly scrambled, and the numbers drawn. The order in which the numbers were drawn was the order in which the suggested names were listed.

Each officer received a list which contained *only* the suggested names, listed in the order in which their number was drawn. If more than one suggestion was submitted by any person (and several persons did suggest more than one name), each suggested name was assigned a number and suggestions by one person were not necessarily listed together. There was no way in which the officers could know who submitted any suggestion.

After the votes of the officers were received, each of them was again contacted to secure his approval of the name finally chosen from the previously returned ballots.

So—beginning with the May Issue, this section will be known as the *Pictorial Digest*. It will contain the same news and information about the activities sponsored by the Pictorial Division, and it is our hope that it will continue to be of help to all PD members—and to the other members of PSA.

Remember that no matter what the name—it is *your* section. We try to pass along photographic hints each month which can help all of our readers. You can get the maximum benefit from it by participating in the activities and using the helpful hints. Read the *Pictorial Digest*. Use the *Pictorial Digest*.

STELLA JENKS *Editor*

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124 East Jefferson St., Butler, Pennsylvania

INTERNATIONAL EXHIBITS
Dr. Glenn Adams, APSA, *Director*
9 East Third Street, Cincinnati 2, Ohio

AMERICAN EXHIBITS
Fred Fix, Jr., APSA, *Director*
5956 N. Sheridan Rd., Chicago 40, Illinois

PORTFOLIO CAMERA CLUBS
Sten T. Anderson, APSA, *Director*
3247 Q Street, Lincoln 3, Nebraska

CAMERA CLUB PRINT CIRCUITS
William R. Hutchinson, *Director*
Box 367, Newburgh, New York

CAMERA CLUB JUDGING SERVICE
W. Dovel LeSage, APSA, *Director*
501 Tenth Avenue, Huntington 1, W. Va.

PERSONALIZED PRINT ANALYSIS
J. Elwood Armstrong, APSA, *Director*
17402 Monica, Detroit 21, Michigan

PORTFOLIO OF PORTFOLIOS
Dennis R. Anderson, *Director*
1219 Race Street, New Castle, Indiana

SALON PRACTICES
Ralph L. Mahon, APSA, *Director*
260 Forest Avenue, Elmhurst, Illinois

RECORDED LECTURES
Dr. C. F. Cochran, *Director*
3946 N. Lawndale Ave., Chicago 18, Illinois

PEN PALS
Major E. J. Hobbs, *Director*
1673 Union Commerce Bldg., Cleveland, O.

AWARD OF MERIT
Warren W. Lewis, *Director*
2055 No. Sedgwick St., Chicago 14, Ill.

ART
Doris Martha Weber, APSA, *Director*
2024 East 86th Street, Cleveland 6, Ohio

MEMBERSHIP
H. Jack Jones, *Director*
P. O. Box 220, Montgomery 1, Alabama

ORGANIZATION
John R. Hogan, Hon.PSA, FPSA, *Director*
1528 Walnut Street, Philadelphia 2, Penna.

HIGHLIGHTS FROM

Portrait Portfolios

PAUL J. WOLFE, *Associate Editor*

Edgar L. Obma, APSA, Dodgeville, Wis., and commentator for No. 6 Portrait Portfolio says, regarding Nelson Gold Toning: "The most important thing about the process is to have a print with a full range of tones in black and white. We wash our prints about one-half hour after fixing. The prints are then put in a rinse of about an ounce of Kodalk to a gallon of water to be very sure there is no residual acid in them. They get a short rinse after that to wash off the Kodalk and toning begins. I never allow the temperature to rise above 110 as they will tend toward yellowish tones if the bath gets too hot. I heave the bath out regularly as I feel the tones of gold are better in a fairly fresh bath. Gold can be added as the formula calls for it, but there are changes in the bath from age as well as use, so why ruin prints with old chemicals?"

Shanti Bahadur, Cleveland, Ohio, and commentator for No. 9 passes on this hint: "If you desire the fade-out effect, you should start with that idea before you expose your negative. Keep your background much lighter than the subject itself, then expose for the intensity of light on the subject. Thus, you would be over-exposing your background, thereby making your vignetting job sparklingly clean-cut. Unlike any other type of picture, fade-out pictures are kept in dead-center of the space, and

the image is kept rather small, thus allowing a large margin of white space all around. Very flat lighting is recommended for this kind of picture."

Shanti Bahadur further advises: "Precautions should be taken to avoid stray wisps of hair. A little pair of scissors should be carried, and if unruly hairs are found on the subject's head, they can easily be trimmed, thus avoiding the retouching problem."

John O. Hay, Cleveland, Ohio, and commentator for No. 10 advises: "A cardinal rule to remember is that each light has a specific purpose and no light should interfere with what another light is supposed to be doing."

Mr. Hay says about the use of Ansco Flemish Toner with Opal and Indiatone papers: "Dilute about 1:10 instead of the 1:3 recommended on the bottle. This will give a good warm tone and sufficient control time so that you can stop the action before it gets too brown. Do not overtone. More prints are rejected in salons for lousy toning jobs than for almost any other reason. The toner keeps well and can be used repeatedly in the diluted form. Don't leave prints in the hypo over 15 minutes and wash them well. The hypo treatment and washing should be uniform over the surface of the print. This toner increases both density and contrast in the print about 10% even before it makes an appreciable change in the color."

On the use of print varnish, Mr. Hay comments: "Have used a varnish for a long time comprised of

1 part *boiled* linseed oil or (raw linseed oil plus a few drops of Japan drier)
1 part Turpentine
1 part Nonpariel Varnish

This varnish is applied with a lint free cloth, rayon or something similar wrapped around the end of a finger. Very little is necessary. If mostly rubbed off, the print will be dry enough to spot immediately with water colors any light spots which may show up. Darker spots can be shaved down a little. These spots can be revarnished with just a trace of the varnish and it will all blend in. You can get snap with very little evidence of varnishing or you can make the print a pronounced glossy depending on how thick you apply it."

Harry Ittner, commentator for No. 7 advises: "Here is a simple and good ferrotyping technique. Get a ferrotype tin, chromium plated, slightly larger than an 8 x 10 tray. Fill the tray half full of water, and put on a hot-plate bringing the water to a boil. Wash the ferrotype tin thoroughly with water and soap, rinse carefully and dry. Place shiny side up on the tray of boiling water. When it is hot take it off and polish the surface with a dry cloth. Take your print out of the wash water, rinse under running water and drain for a few seconds to let excess water run off. Place the print face down on the ferrotype tin. Put blotter on top and run over it hard and heavy with a roller. Take off blotter and roll some more as success depends upon tight contact between tin and print. Place tin, print side up, on the tray of boiling water and cover with a towel. You now have before you from the top down: a towel, the print face down on the tin, the ferrotype tin, and the 8 x 10 tray of boiling water. In two or three minutes the print will loosen from the tin. Remove it and place *alone* on another surface for at least ten minutes before piling other prints on top of it. Polish tin again before putting on the next print. Wash tin about every 10 or twelve prints or they will stick. Keep two tins working on tray and things will go in a hurry."

Have fun. Learn from the experts. Join a Portrait Portfolio. Write Paul J. Wolfe for data.

MISS EVELYN M. ROBBINS, *Associate Editor*

Would *you* like to have a collection of prints come to your home, where you can study them at your leisure?

Would you like to have the constructive criticisms and suggestions of from twelve to fourteen other photographers telling how you can make a beter print of your photograph?

Would you like to have the help, guidance, criticisms and suggestions on your work by an outstanding photographic authority, a recognized pictorial photographer?

Would you like what is in reality a course in photographic techniques and composition under the personal supervision of the leading photographers of this country?

Your membership in the Pictorial Division entitles you to all this, and, if you are not taking advantage of this opportunity, you are not getting the full value of your PSA and Pictorial Division membership.

Membership in the PSA American Portfolios brings this help to you. It is open to all members of the Pictorial Division upon the payment of a service charge of $1.00 per year for each circle in which one enrolls.

There are two excellent ways to improve your knowledge of what is good and what is bad in a picture. One is by studying the written criticisms of your own prints and the other is by writing analyses of other people's prints. Of the two methods, the latter is the more educational and the more important.

When you join a PSA Portfolio you will be sent a Technical Data Folder which should accompany your initial print. You submit one of your best prints with a description of how you made it and your reason for making it. This print is then placed in a portfolio circle along with the prints of from twelve to fifteen other members of the circle, each from a different part of the country and is sent by express to each member in turn along a straight line route. When the portfolio reaches you for the first time, you will fill in a page in the notebook that accompanies the portfolio, making yourself acquainted with the other members of your group. You will tell of your photographic experiences, aims, likes and dislikes. You should put in a snapshot of yourself as many do for it helps to break down the barriers of distance to know what the other fellow looks like. You are going to meet some nice people and to make some interesting friends.

You are permitted to keep the portfolio for five days during which time you are able to study the comments made by the other members of your circle about your picture and you in turn will discuss all of theirs. You will find that there are members of the circle who are keen on techniques, others have a knack for composition, some are able to point out the reason for something about your print that has been puzzling you, one or two may not know much about photography as yet but may have interesting viewpoints and worthwhile suggestions to offer. You may perhaps show the prints to your camera club so that all may benefit from it. Many camera clubs have several members in the various portfolios so that one is available at almost every meeting. It is fun to compare the different groups and the different commentators.

At the end of each circuit the portfolio is sent to a commentator, one of the top flight pictorialists in the country. The commentator will offer suggestions to the makers of all the prints and will help them by his constructive criticism.

It normally takes about four months for a portfolio to make a complete circuit—barring member delays, express embargoes, etc. Then considering the time with the commentator and in setting up a new circuit, the portfolio should reach you twice a year. Some circuits with a membership

AN INVITATION

This is an invitation to every PSA member to participate in the PSA American Portfolios.

Enrollments are now being received in the following specialized groups:

PSA Pictorial Portfolios
PSA Portrait Portfolios
PSA Miniature Portfolios
PSA Control Process Portfolios
PSA Star Exhibitor Portfolios
(For PSA Award of Merit Winners)
PSA Nature Portfolios
PSA Photo-Journalism Portfolios

For information concerning any of the foregoing activities and for enrollment blanks, write to the Director of the PSA American Portfolios, Eldridge R. Christhilf, Hon. PSA, APSA, Suite 406, 800 Davis Street, Evanston, Illinois.

of 12 and with each member cooperating will make the circuit three times a year.

There is a place in the portfolio activity for every member of the Pictorial Division, whether he be a beginner or an advanced worker. Send your enrollment now, accompanied by the service charge of $1.00 per year for each circle in which you wish to enroll, to E. R. Christhilf, Director.

Portfolio Medal Award

ELDRIDGE R. CHRISTHILF, HON. PSA, APSA

Our Portfolio Medal Award this month goes to Frederic Calvert, of Chester, Pennsylvania, whose print, "Dorothy," which had previously travelled in PSA Pictorial Portfolio No. 30, was accepted and hung at the 13th Annual Salon of Photography at Springfield, Mass.

In writing about his print, Fred Calvert says:

As you know I have been banging around in photography for quite a few years and wasn't getting anywhere. Last year I decided to do something different. I was going to take lots and lots of snow pictures and get a reputation in that field. But we had no snow last year and thus far this year there has been none. Last year a friend of mine and I were discussing the situation, and, while he has a very small studio that he uses as a hobby only, I suggested that we get a few figure models and try some high key figure work. He thought it was a good idea. It took a few weeks before we could find a suitable model. We had three and Dorothy is by far the best one. While I have a lot to learn I find the work most interesting—even though it is more expensive than snow scenes. But you do not freeze to death. I can just look at the snow and my teeth begin to chatter.

The camera that I use is a 3¼ x 4¼ Auto Graflex with an 8" f/4.5 Schneider lens. We have a large white paper background that came down and over the posing bench. Our main light is a #4 in a large reflector with several smaller fill-in lights. I also use a small ring light on the camera but I need to do something with that as it does not work so well. The finished print was printed on 5 x 10 Cykora and mounted on a 16 x 20 salon mount. The film used was DuPont High Speed Pan, developed in a tank using Ansco 17 for 15 minutes. The paper was developed in 55D for two minutes.

For those who are not familiar with the PSA Portfolio Medal Awards, the only requirements are that one must never have previously had a print accepted and hung in a recognized international salon and that the first print thus accepted and hung in a recognized exhibition shall be one that has travelled in a PSA Pictorial Portfolio or that is travelling in a PSA Pictorial Portfolio at the time of its acceptance. When you qualify, merely drop a line to the Director, PSA American Portfolios, and an application form will be sent you.

PSA Miniature Portfolios

EDWARD CROSBY, GENERAL SECY.
PSA MINIATURE PORTFOLIOS

Here are a few of the assorted personalities that make up PSA Miniature Portfolio Circle #1: A banker, C. Bronson Weed; a photographer by profession and a watercolor artist by advocation, Walt Carter; a student of Mortensen, Dennis Anderson; a retired army officer with a tremendous zest for living and an unfailing sense of humor, Col. Charles "Joe" Perry.

"DOROTHY" Frederic Calvert

Ruth Hare, of Newark, N. J., supplies the feminine note, and Jay McFarland, our youngest member, will some day become a "pro." A beekeeper, a lawyer and a doctor add to this assortment of callings.

All these are tied together by long strips of 35mm film and through the tangle emerges lots of fine 8 x 10 prints. Some have salon possibilities; others considerable promise. Each round produces better prints, better pictures, and practically no discussion of technique—which is amazing!

Mr. and Mrs. Arthur Mawhinney, of New Rochelle, New York are the joint Commentators of Circle #1 who are providing interesting and instructive comments on our efforts, and we folks in Circle #1 feel very fortunate in having their advice.

Circle #2 is about ready to be set up as this goes to press and enrollments are now being received for Circle #3. Why not come in on this activity if you work with 35mm, Bantam and up to ⅜ 127 film size. The service charge is $1.00 per year for each Circle in which you wish to enroll, and the enrollment should be sent direct to the Director, PSA American Portfolios.

"Star Dust" *

ROY E. LINDAHL, GEN. SECY.
PSA STAR EXHIBITOR PORTFOLIOS

Last month we promised to let you in on what an artist has to say about this subject which has been so thoroughly discussed in this column for the last few months. Doris Martha Weber, APSA, who holds the position of Art Director for the Pictorial Division, writes as follows:

"Since I am an artist as well as a photographer or vice versa, I naturally want to get into this argument about museums, salons and such. Having exhibited frequently at the May Show of the Cleveland Museum of Art in painting, ceremic sculpture and batik as well as photography, I may say that I get no particular thrill out of it nor do I feel that I have accomplished much when my work is accepted be it painting or photograph. The judges of present day exhibitions accept far too much corny stuff—mere gymnastics with a paintbrush or palette knife wielded in such a manner as to conceal the fact that they (the artists) can't draw. Anything seems to hang if it is bad enough and if it is hard to understand so much the better. Of course, we still have men who can paint, but the contemporary exhibitions could stand some wide open spaces around these genuine works of art rather than the hodgepodge of heterogeneous hokum which surrounds them now.

"In this year's May Show a young man I know decided to get into the decorative painting class by being different. He painted a rather fantastic mass of unrelated forms and occasional block-lettered words in German. He then coated the under side of the glass which would cover it with white paint or perhaps it was Bon Ami and drew concentric circles through the stuff starting at the center of his picture. He called it "Abstraction No. 2" and not merely hung it but won an Honorable Mention.

"If museums hang so much stuff which is anything but art, and the same judges, as is usually the case, pass on photographs, why should photographers worry when their pictures are turned down or salons are turned away? If museums do hang photographs they are apt to take shows like the one that I saw in Chicago last summer at the Institute of Modern Design. Apparently the photographer had made a series of negatives of Greek ruins, columns particularly, and then had doubleprinted them with a series of negatives of old mansions on Southern plantations. The ruins being white marble gave a ghostlike effect when combined with the dark shadowy trees and gardens. He had written a lot of screwy interpretations to go with them about the spirit of old Greece living in Southern culture and now going to decay, etc., *ad nauseum*.

"The Institute would naturally hang a show of that kind for I visited their classes. They were encouraging their students to experiment with abstractions in the design classes, and in sculpture the weird kind of formless stuff which seems to be built over sections of sewer pipe, lengths of wire and queer shaped pieces of tin, and which needs lengthy explanations of what their maker was striving for to be understood even vaguely by a person of average intelligence. Is this art? Not to me! The director, in all seriousness, told me the students were not trained in techniques of any kind for fear that they might be "influenced," but were encouraged to experiment with any idea which occurred to them. On graduation he said they would be prepared to enter not one field of art but any which came along. Just how he expected them to develop any skill if, as he said, they had no guidance is a mystery to me.

"Aubrey Bodine, I am afraid, wraps a mantle of wisdom and good judgment about artists and museum directors which is un-

* A monthly column devoted to the "Wit and Wisdom" of the Stars as taken from the Notebooks in the Star Exhibitor Portfolios.

deserved. Merely having salons judged by artists would not be a cureall for what ails salons. Granted that many poor photographs are hung, still I think the proportion of poor photographs is lower than that of inferior work in the art exhibitions by far. I have just returned from seeing John Hogan, Harry Shigeta and Frank Fraprie judge the Milwaukee salon. Among over 2000 entries there were many what you guys call lousy prints but they didn't get hung and the awards went to really beautiful pictures by Standish and our friend Aubrey. So there is still some hope.

"It is an established fact that Vincent Van Gogh was crazy (he was the guy who sent one of his ears to a lady friend, you will recall) and you didn't have the faintest doubt of it if you saw the exhibition of his work which visited several American museums a few years ago. You could almost hear the insane laughter and had a terrible feeling of being walled in. I sometimes feel his popularity with modern critics is responsible in no small measure for the nuttiness of much of the so-called modern stuff. Since museums are hanging paintings of strangely fantastic forms, distorted, poorly drawn and poorly proportioned figures, and since anything which bears any resemblance to an accurate portrayal of nature and things as they are in reality rarely gets by, it stands to reason that photographs which are true to life would be taboo also. So while it sounds swell to have a museum address for a salon I wouldn't worry about it, Aubrey. It is just a phase. The salons will be back in the museums for the public loves them and even museum directors have ears."

Next month—Aubrey Bodine presents some rather startling results of the judging of the Continental print contest.

Comments of a Commentator

THIS MONTH: ANNE PILGER DEWEY, HON. PSA, APSA, COMMENTATOR OF PORTFOLIO CIRCLE #4

If there is any single thought that I would like to pass on to members of the Pictorial Portfolios it is this: Don't slavishly copy the work of others!

If a certain type of print has been hanging regularly in salons, don't make that type of print. Far too often a new idea is incorporated in a print, submitted to the salons, is accepted everywhere, is reproduced in the various magazines—and then a dozen or a score or a hundred other print makers start turning out reasonably accurate facsimiles thereof, attempting to ride to salon success on the shirt tail of the artist who created the original idea and the original print.

It is true that you can get a good salon record quickly by this procedure, but it is impossible for me to understand how anyone could derive any satisfaction whatsoever from success derived from simply copying what others have done.

You men and women who are profiting by your membership in the Pictorial Portfolios are the future big league salonists. Regardless of your actual ages, you are the children of pictorial photography who will inherit tomorrow. It is your work that will dominate the salons five and ten years from now. The future of the salons and of pictorial photography are in *your* hands —not in the hands of the established pictorialists of today.

There is just one other factor involved: the judges. The judges in most salons are men and women who have had a great deal of experience in pictorial photography, and it is only natural that their views should be the views of those who had their heyday a decade or two decades ago. They naturally tend to select the kind of pictures they learned to make, and to look with suspicion and even disfavor upon anything new and different.

Do not let this discourage you, however! If you will produce new and original types of pictures for your portfolios, and a little later on, for the salons, even the most hidebound of the judges will slowly but surely learn to see the beauty and significance of the newer type of pictures, and they will hang—very much to the benefit of the salons!

So, when other members of the portfolio or portfolios to which you belong submit pictures which are not exactly like all the other pictures you have seen in the salons and reproduced in the magazines, don't jump on those prints and condemn them, and don't say simply that you don't understand them, and can't comment on them. Study those "different" prints. Think about them. View them with an open mind, and then comment on them honestly and thoughtfully.

By so doing you will help and encourage those fellow members of your portfolio or portfolios who are trying to be original instead of trying to copy the work of others, and you will likewise be learning to understand and appreciate the kind of prints that will inevitably dominate the salons in the years to come.

Photography is a progressive art. It has never stood still, and it never will stand still. The shackles the old-time reactionaries would like to place upon your work today will be broken, in exactly the same way that today's old-time reactionaries broke the shackles that *their* predecessors attempted to place upon them.

Chirps from the Robbins

This month we have a new member with us: The PSA Miniature Portfolios. New? Well, no, but new to this column. We're very happy to bid them welcome, and say that we hope they will stay and give us all the news and views from the users of the 35mm, Bantam and up to ½ 127 Film Size.

Eldridge Christhilf brought this very portfolio with him to the Convention in Baltimore, and it was on display in the Portfolio Room. I'm sure that those of you who were fortunate enough to be there and see it, found it to be very fine and more than a little exciting.

Plan now to attend
PSA CONVENTION
Detroit, Mich., October 10–13

The International Portfolios

DR. WM. F. SMALL, APSA, *Associate Editor*

Various letters received by the PD read:

"From Truillio City, the oldest city in the Americas, the members of the Dominican-American Portfolios send a cordial message of friendship to all the photographers of the Americas!

"The circulation of the Dominican-American Portfolios among its Dominican members has been an enjoyable source of artistic pleasure and an outstanding fact in the photographic annals of this old country, the Dominican Republic. These portfolios travel throughout the world carrying, like the most precious flower, a message of beauty, truth and friendship. We Dominicans have received this significant message with all the effusion of our hearts and this is a fact linked to the glory of our history.

"Since our island, The Hispaniola, which the Indians called Quisqueya in their language, was discovered on the 5th of December, 1492, all the efforts and the life itself of each of its dwellers have been consecrated to the practice of the highest civic virtues as a people who love justice and liberty. Our old harbors contemplate the magnificent defile of the ships which, full of adventurers, priests and soldiers were carrying the Sacred Cross of the Christians to the mysterious and savage lands of the new continent. Our arms were always open and our hearts ready to quench the thirst, to feed the hungry and our hearts longing to offer courage to those coming to light the splendor of a new civilization in these lands that now are the hope of the world. Loyal to this historic conduct, we have accepted, full of pride, the honor afforded to the Dominican photographers of their inclusion in the portfolios sponsored by the Photographic Society of America.

"The international character of these portfolios affords them a transcendental role as a practical school of photography which teaches through the prints brought to them, and also through the ideas, comments and criticism that these prints suggest to the devoted members of those portfolios. Their benefits go even farther: speaking a universal language, photography can create, communicate and expand throughout the surface of the earth, the history of mankind, arousing indignation against the worshippers of evil and applauding and praising those who love justice, truth, beauty and liberty. Not only scenes and artistic portraits are included and considered in the prints of every portfolio, but what is most important, the character of things and those human deeds whose importance make the whole story of the civilization

of our times. It is this character of things that adorns the portfolios with beauty, to awaken newer and wider esthetic emotions. It is this character, whether mystic, artistic or philosophic that makes evident the intense and dramatic truth potentially existing in any spectacle, physical or spiritual. It is the soul and, by extension, the ideals and concepts of our countries that will speak through our pictures to say to one another how we live, how we think, how we work, how we love our most appreciated privileges and what we have in common in our sentiments and purposes.

"We are full of hope for the improvement of our pictorial art through these Dominican-American Portfolios, which were preceded by the Caribbean-American Portfolios, now including Mexico. Being restricted to see and consider our own production of prints, the new prints will bring new ideas and we will realize the possibilities of our medium and excel our own work. Although we have excellent professional photographers, improvement will now go, with the help of these portfolios, to the almost unknown world of the amateurs.

"The great French philosopher, Elie Faure, said in his outstanding book, "The Spirit of Forms," that the Eternal Cycle of our present civilization might be described as a cruel and endless battle between science, dismembering the universe with its analysis, and love with its constructive purpose of joining again the parts that science separated. The survival of mankind depends on the triumph of love. We are rendering a devoted tribute to this constructive love through our PSA International Portfolios."

JUAN ULISES GARCIA, GENERAL SEC.
DOMINICAN-AMERICAN PORTFOLIOS

International Process Portfolios

A recent letter from John Bell, the English secretary of the Process Portfolio, says their membership roster stands at nine now, but he is expecting more to join. There are some well-known English workers joining —Almond, an outstanding worker in gum, George Halford who is widely known for he does the most fantastic things, G. L. Hawkins who wrote the book on bromoil considered the authority on the process, and Barraclough, another well-known bromoiler. He feels the English workers will do fine, in fact, he was a little disconcerted at getting so many good ones to join.

Originally the secretaries thought we could not get ready very soon, but Ball has told his members to be ready by the first of May, and it is too late to change. So the American members will have more time to get prints ready. Those who have already sent prints may, if they wish, substitute others. Also there will be plenty of time to write up technical data. The English plan to give us a lot, and are looking forward to their work. If each member could write up (on pages that will fit our notebook, 8½ x 11) a discussion of his experiences and beliefs relative to processes, Dr. Handly, secretary of the Process Portfolio, will embody these in a technical notebook. There will be plenty of time to do this.

This portfolio will be for our pleasure, and that will be greater if the members will swap technical data of their experiences. Dr. Handly has promised to put in a great deal of his own experience in the book. So far, most of the members seem to be doing bromoil and/or transfer. But that, if anything, will make it more interesting. We will have the chance to compare the results of the processes, and perhaps extend our interests.

At the present time, the American members are Herman Getz, Edward L. Bafford, APSA, Burton D. Holley, APSA, Ralph Ross, Robert L. McFerran, APSA, George A. Mueller, R. M. McDaniel, Dr. J. L. Hutton, and Dr. L. L. Handly.

If you are interested in joining an International Process Portfolio, write to Dr. L. L. Handly, 716 West Alabama Avenue, Houston 6, Texas.

PSA International Portfolios

There are openings in the following PSA International Portfolios for Pictorial Division members who are interested in interchanging prints for comment and analysis with the leading photographers in foreign countries:

Anglo-American
Canadian-American
India-American
Australasian-American
Cuban-American
French-American
Swedish-American
South African-American
Brazilian-American
Belgian-American
Chinese-American
Netherlands-American
Dominican-American
International Medical Portfolios
Costa Rican-American
Caribbean-American
Mexican-American
International Control Process Portfolios

For information, write to the Director of PSA International Portfolios, Miss Jane J. Shaffer, 5466 Clemens, St. Louis, Missouri.

The Recorded Lecture Program

DR. C. F. COCHRAN, *Associate Editor*

"Some of the members are still talking about the program and want to know when we could have more." This is typical of the remarks in letters received from clubs which have had programs making use of the PSA Recorded Lectures. Those of us who have been connected with this activity have felt from the start that these tape recordings and slide sets would prove to be a really beneficial program but, like any other course of action, we could not be sure until our "product" was field tested. No matter what we thought of them the final test would come when a club paid for a program and used it. What would the "customer reaction" be? That was the question.

Well, the reaction was good. It was better than we had hoped it would be. It is natural for the program chairman of a club to be on the lookout for a program for his club. They are a notably desperate lot. In some of the more remote sections of the country we were sure that they would grab at most anything, or at least some of them would. The real test would come when they reordered because they liked the first one. This happened and we were convinced.

The booking schedule started filling fast and even early in the program much of the scheduling was repeat business. Dates are reserved for as much as ten months in advance.

Almost every product makes use of testimonials in their promotion. Here are a few quotes from letters which have been received. They seem to support our contention that we have a quality product.

"Our club was enthusiastic and want all of the programs. This activity is really a godsend to clubs such as ours."

"Congratulations on the splendid job . . . presentation of the subject was very entertaining as well as instructive."

Bookings have been very tight. By this I mean that the response has been great enough that we have had to refuse some requested dates and offer second and third choices. It is hoped that this situation will soon be eased by the announcement of new releases and by the procurement of additional sets of slides for existing lectures. Both of these sources of additional material will quite likely be on hand by the time you read this.

Those on the mailing list will be notified of new releases as fast as they are available.

Do not forget the change of address for inquiries and bookings. The new assistant to the director, as announced in the last issue of *The Folio*, is William E. Salyards, 417 McDaniels Ave., Highland Park, Ill.

Mr. Salyards, as Chairman of Distribution, will handle the booking and distribution so address him for information and dates. Any correspondence regarding the recordings themselves, new subjects, criticisms and suggestions, and possible speakers should be directed to the Director of the Recorded Lecture Program, Dr. C. F. Cochran.

LYNNE PASCHALL, *Associate Editor*

Did you ever attend a Portfolio Camera Club meeting? There are a number of them now. We have received a communication from Sten Anderson of Lincoln,

Nebraska. Mr. Anderson is the director of Portfolio Camera Clubs and is very enthusiastic about the plan. If you know eight people who are on portfolio circuits, you can organize a club of your own, and Mr. Anderson will be glad to help.

The letter we received had been delayed on the way, unfortunately, but told about some interesting meetings held by the Lincoln Portfolio Club during the fall and winter:

"On the 27th of October, John DePutron, local commercial photographer and past president of the Lincoln Camera Club, appeared before our club with a model and a series of prints showing various types of lighting. The unique part of his demonstration was that all of the negatives were made with a small camera costing less than ten dollars, and yet they had a very professional appearance. Following the talk, the model posed for the club, and prints from the negatives will be shown at a future meeting."

Mr. Anderson enclosed an 8 x 10 print made by one of the club members and showing the model posing before a background made up of all the demonstration prints.

William R. Hutchinson, Director of PSA Camera Club Print Circuits has the following to say about his work: "This activity is now well established and clubs all over the country are participating. It provides the answer to a very interesting program for any club.

"The rules are very simple. All you have to do is write for the information sheet and signify your club's intention to participate. Get your three prints ready, and the Director will advise you when to send them. Do not send prints until advised. In this way, prints do not lie around indefinitely, and are assembled in the circuit promptly when received.

"Please note, Camera Club Print Circuits call for three prints only, and not four mentioned by some inquirers."

The Director of American Exhibits announces that a brand new print show from the Photographic Guild of Detroit is now ready for circulation among the camera clubs of PSA. This group of pictorial photographs represents some of the best work of many of our finest exhibitors and is a show that no club should miss. There will be a great demand for this exhibit, so to insure a place on our schedule please get your application in early.

Other American Exhibits are in constant use by camera clubs from coast to coast for exhibition and discussion. If you have not made use of them, now is the time to start. In addition to the Detroit Guild show the following exhibits may be had:

Louis Davidson's Portraits and Landscapes
John R. Hogan's Seascapes
Edward Alenius' Salon Prints of Ten Years Ago
Ft. Dearborn Camera Club Show of varied subjects
Edward C. Crossett's Portraits and Landscapes
Carl Mansfield Show of Human Interest
The Masters' Show of the PAA.

All these exhibits are available by writing Fred W. Fix, Jr.

Flash—As we go to press, announcement is made by Mr. Fix that 3 superb documentary shows, collected by Roy Stryker and Standard Oil, are now available for club use without charge. Get your reservations in immediately. More details later.

PSA Recorded Lecture Program Catalogue

The Recorded Lecture Program of the Pictorial Division offers the following programs for your club.

No. 1. An Analysis of Recognized Salon Prints by Ragnar Hedenvall, APSA

No. 2. Commentary on Recognized Salon Prints by Morris Gurrie

No. 3. Outdoor Photography by D. Ward Pease, FPSA

No. 4. Still Life by Ann Pilger Dewey, APSA, Hon. PSA.

SPECIAL Photography of the Nude by P. H. Oelman, FPSA

A deposit of $25.00 should accompany an order. A service charge is made for each Lecture. The SPECIAL costs $10.00 and should be ordered directly from Mr. Oelman. The others cost $6.50 for clubs which are members of both PSA and the Pictorial Division. Clubs which are members of PSA but not of the Pictorial Division will be charged $7.50. Non PSA clubs and organizations are charged $10.00.

For Nos. 1 to 4 order from: William E. Salyards, 417 McDaniels Avenue, Highland Park, Illinois.

For the SPECIAL please contact: P. H. Oelman, FPSA, 2505 Moorman Avenue, Cincinnati 6, Ohio.

News of the Pictorial Division

Personalized Print Analysis

Do your pictures have good composition? Successful pictures invariably present an interesting subject in a technically good print with effective composition. Putting things together which belong together in a pleasing arrangement is good composition. Composition is most effective when applied subtly without visable effort to conform to the prescribed conventions which have been in use for centuries. It is then that a pictorialist, drawing on his background and artistic feeling, automatically applies the language of line, the beauty of design, the effectiveness of unity, the harmony of the composition, and the principles which improve the presentation of the picture.

If you are a P. D. member, you can have your prints analyzed by experts and receive the benefit of their knowledge and experience by following a few simple rules.

Prints should be 5 x 7 to 8 x 10, sent first class with return mailing label and first class postage included. On the back of each print should be the name and address of the maker, title of the picture, technical data and pertinent details. Also include a brief statement of the idea or purpose behind the picture, and the purpose for which it was taken (club contest, salons, etc.). To help the analyst do as good a job as possible, a contact print or small enlargement of the entire negative should be attached to the back of the print.

Prints should be sent to J. Elwood Armstrong, APSA Director. A comprehensive analysis and appropriate comments will be returned with each print.

Award of Merit

Advances in ratings of star exhibitors since the last published list are as follows:

Advanced from 1-Star to 2-Star
Bernard M. Acosta, Saranac Lake, N. Y.
D. C. Brownell, San Francisco, Calif.
Advanced from 2-Star to 3-Star
J. P. Carney, Griffith, N.S.W.

This is the first listing in many months that does not include at least a few new 1-Star exhibitors. It is not difficult to obtain a 1-Star rating and the pleasure and pride in possessing an Award of Merit certificate is well worth the effort. Only 30 acceptances of six different prints are required for this recognition. Send the names of your prints and the name of one salon where each has been hung to Warren W. Lewis, Director, and you will receive one of the coveted certificates.

Award of Merit Tabs

Have you earned an Award of Merit? Do you wear an Award of Merit Tab to indicate your rating?

These Award of Merit tabs come in four different colors representing the different grades of Star Exhibitor. They are available in yellow, red, blue and purple to correspond with your rating, are attractively made to be worn with your PSA lapel button.

In ordering, state whether you are a one, two, three or four Star Exhibitor, enclose $1.00, and mail your request to Warren W. Lewis. You will get your tab by return mail. Checks should be made payable to the Photographic Society of America.

Editorial Changes

It is with deep regret that we report the resignation of Miss Charlotte Kessler as Associate Editor of the News of the Pictorial Division section of *The Folio*. Charlotte has served as Associate for over a year now, and her resignation was necessitated by increasing business pressure caused by a change in her work

We welcome as the new Associate Editor of this section George Green of Boston, Massachusetts, one of the most active in-

dividuals in photographic circles in New England. His duties will start with our next issue.

Coming Salons Agreeing to Follow PSA Recommendations

NOTE: M—monochrome prints, C—color prints, T—color transparencies, SS—stereo slides, L—monochrome slides, A—architectural prints, S—scientific or nature prints. Entry fee is $1.00 in each class unless otherwise specified. Recognition: The monochrome portions of salons listed have Pictorial Division approval. Check salon list of appropriate division for recognition of other sections.

Seattle (M) Exhibited Apr. 4–May 6 at Art Museum.

Louisville (M,T) M exhibited April 28–May 20 at J. B. Speed Art Museum; T at Louisville Free Library April 13 and 18.

Baltimore (M,C) Exhibited Apr. 17–May 7 at Enoch Pratt Free Library.

Portland (M) Exhibited Apr. 15 to May 13 at L. D. M. Sweat Memorial Art Museum.

Cincinnati (M,T) Exhibited Cincinnati Art Museum from May 3–18 Data: H. G. Balthasar, 6541 Elwynne Drive, Cincinnati 36, Ohio.

Toronto (M) Exhibited Apr. 30–May 12 at Camera Club. Data: Rex Frost, Toronto Camera Club, 2 Gould St., Toronto, Ont., Canada.

St. Louis (M,C,T) $2.00 entry fee for prints. Closes May 23. Prints exhibited at St. Louis Art Museum June 9–24; T at Museum June 11, also at Scruggs Vandervorst & Barney June 16 and 18. Data: Fred Kirby, 512 Mo. Pacific Bldg., St. Louis 3, Mo.

Memphis (M,T) Closes May 28. Exhibited July 1–28 at Brooks Art Gallery. Data: Mrs. Louise Clark, Brooks Memorial Art Gallery, Overton Park, Memphis, Tenn.

Southwest (M,T) M closes June 1; T June 8. Exhibited June 29 to July 8 at San Diego County Fair. Data: Salon Secretary, Box 578 Del Mar, Calif.

Hartford (M,C,T) T Closes July 10; M, C on July 17. Exhibited T Aug. 1–18; M and C Aug. 1–31 at Wadsworth Atheneum in Hartford. T also exhibited in nearby towns. Data: Raymond J. Le Blanc, 234 So. Quaker Lane, West Hartford, Conn.

Cleveland (M,C,T) Closes Aug. 20. Exhibited Sept. 10–21 at galleries of Higbee Company. Data: Mary Jane Matheson, 12317 McGowan Ave., Cleveland 11, Ohio.

Puyallup (M,C) Closes Sept. 5. Exhibited Sept. 15–23 at Western Washington Fair. Data: Western Washington Fair Assn., Puyallup, Washington.

Mysore (M) Closes Sept. 20. Exhibited during November. Data: K. Girimaji, Sri Ramamandir Road, Bangalore 4, India.

Other Overseas Salons

Johannesburg (M) Exhibited during May at Port Elizabeth, Durban and Pietermaritz. Data: Peter Marples, P. O. Box 7024, Johannesburg, So. Africa.

Barrow-in-Furness (M,S,L,T) Exhibited May 12–19 in Town Hall. Data: H. McMaster, 89 Yarlside Road, Barrow-in-Furness, Lancashire, England.

Barcelona (M,C) Exhibited month of June at the club. Data: Secretario Agrufacion Fotografica de Catalusa, Duque de la Victoria 114, pral, Barcelona, Spain.

Shropshire (M,C) Closes May 16. Exhibited June 16 to July 7 at Borough Library and Museum. Data: G. W. J. Newey, St. Quentin, Porthill Drive, Sharewsbury, Shropshire, England.

Birmingham, (M,S,C,L,T, Scientific L Slides) Closes June 16. Exhibited July 28 to Sept. 1 at Art Gallery. Data: R. Cleaver, 14 The Mount, Cheylesmore, Coventry, England.

Denmark (M,C) Closes July 1. Exhibited Aug. 12–16 at Charlottenborgs Art Gallery. Data: Aage Remfeldt, Havdrup, Denmark.

Sao Paulo (M,C) Closes July 15. Exhibited in September. Data: Ray Miess, 1800 N. Farwell Ave., Milwaukee 2, Wis. or Foto-Cine Clube Bandeirante, Rua Avanhandava 316, Sao Paulo, Brazil.

Jonkoping (M) Closes about Sept. 1. Exhibited Sept. 22–30. Data: Ingvar Sjoberg, 32 Barnarpsgatan, Jonkoping, Sweden.

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H. J. JOHNSON, FPSA
2134 Concord, Chicago 47, Ill.

Print Criticism Innovation

It seems that most clubs must have a few members who feel that a print critic is no good unless he kicks their teeth in. How to please these and at the same time serve those whose perceptions do not need such coarse treatment is explained in the following article from the Seven Hills Photographers' Bulletin:

Back in the good old days, it really took a lot of grit to exhibit a print. No matter how good your print was, some blasted cuss would sit back and want to know — "Why in . . . would anyone want to make a stinking print like that" — and really mean it.

Age has mellowed the exhibitor and the critic until today we sort of take the attitude that there is some good in just about every print and therefore proceed to praise the good part and soft-peddle the bad. This might have its merits — then, again, it might be going too far by giving the print maker a feeling of complacency — with resultant satisfaction with his work and failure to progress.

The oldtime sarcasm was not good either — it made many disgusted photographers and many enemies.

Our Print Committee is going to strike at this situation and come to a happy medium. Here's the plan for future trial:

(1) The prints will be shown through the light box — hung on the wall and voted upon in the usual manner.

(2) After counting the votes, the prints will be run through again and criticized in the usual sweet manner, giving credit where credit is due. This, again, is the usual procedure.

(3) Now — for those wishing to have their prints really criticized and given a first-rate going over, ripped apart, not sarcastically but strong enough to actually mean something to the maker in a helpful way — will be given the opportunity to have their print or prints run through the light box again, and from there on he must defend his honor.

Your Print Committee believes this will not only toughen the exhibitor, but will also go far toward helping him to make better and more interesting pictures.

Your Club's Future

Camera clubs are in for some severe testing.

Weakling clubs are going to fail and incompetent officers are going to blame the war, overtime, inability to obtain equipment, restrictions on photography, etc. However, these hardships are going to affect all clubs alike. They are the common denominators of trial. The variables from one club to another are the officers.

Those clubs most likely to be in existence two years from now will be those best able to see and plan that far ahead, to anticipate certain developments, and to work out appropriate measures.

Most clubs must expect to lose some of their membership to the draft.

To make up for some of this loss, the club may obtain more women members and more members older than the previous average. Also the normal peace time rate of loss in members may be reduced. The more efficient a club and its officers, the more success the club will have in reducing membership losses.

Even so, there may be a net loss, and this will be reflected in decreased finances, attendance, and support for club projects.

The first of these can be met (and should be) by some increase in membership dues, especially if the same level of activity is maintained.

Not only loss of members, but requirements of overtime work and special duties will help cut attendance. All clubs will be equally affected by these factors, but the club with imaginative and efficient officers will be more successful in minimizing the results.

Poor attendance is the most serious problem a club will have to contend with. It is both cause and effect. In the club it is disheartening to those who do attend and leads to further drops in attendance. Club projects receive less support, leading to failures, and the result is more missed meetings.

High grade speakers and lecturers (even when paid) will not waste their time with insignificant groups. Eventually a second rate club will find itself able to obtain only second rate program material, and there is a further drop in attendance.

Drastic action is required to break this descending spiral.

When clubs which meet weekly begin averaging less than 50% attendance, the meetings should be reduced to two a month. Those meeting twice a month should change to monthly meetings.

Then business meetings or portions of meetings should be reduced or eliminated. These are always boring, especially when there is some windbag member who quibbles about constitutional points or haggles an hour over spending a dollar. (Let officers take care of business).

Starting meetings reasonably on time also will help attendance. Busy members cannot afford to waste time for an 8 o'clock meeting to get started at 8:15, 8:30, or 8:45.

Finally, the programs must be made so valuable and interesting that members will make special efforts to attend. Here lack of imagination on the part of officers and lack of intimate knowledge of the membership's needs will lead to meetings which are mediocre and without sparking power.

Perhaps it would be more accurate to say that not the camera clubs, but the officers are in for some severe testing.

Who's Who Revision

The following names represent revisions in the print show Who's Who for 1949–50 after we obtained the Bangalore and Evansville catalogs (the first figure is exhibitions and the second is prints):

Anders Aalborg, 17–26; Dr. Glenn Adams, 31–61; Dr. John S. Anderson, 22–35; Felipe Atoy, 6–11; George Avramescu, 7–11; Axel Bahnsen, 37–96; Grace Ballentine, 20–35; H. G. Bancroft, Jr., 21–33; Kent W. Bartlett, 7–12; Jan Beran, 3–3; Edythe Biggs, 19–22; Florence R. Bittman, 7–9; Alfred Blyth, 17–34; Howard Booker, 4–5; Theodore L. Bronson, 29–69; Earle Brown, 25–65; William E. Bush, 5–11; Eugenia Buxton, 37–72; Ruth Canaday, 4–6; John P. Carney, 15–23; Willard H. Carr, 20–33; Charles N. Chambers, 3–6; Dewey Clark, 6–10; Felix F. de Cosin, 3–6; Ferenc Csik, 4–7; Dr. Tibor de Csorgeo, 12–25; Eleanor Parke Custis, 40–123; Glen E. Dahlby, 15–20; Shankerlal Davay, 6–12; Angel de Moya, 12–22; Edward T. Deskiewicz, 9–12; Pietro Donzelli, 4–6;

Dhruva Coomar Engineer, 5–9; Jorge Figueroa, 10–15; Jose Oiticica Filho, 28–52; J. O. Fitzgerald, Jr., 17–30; Fred W. Fix, Jr., 7–13; Frank R. Fraprie, 28–63; Roman Freulich, 3–5; Rex Frost, 32–64; J. Wallace Galloway, 36–67; F. Geeraerts, 3–3; Francesco Giovannini, 6–7; Lt. Col. F. G. Hall, 3–5; Mrs. S. Adele Hankins, 3–4; Roy Hargreaves, 11–22; Hal Hart, 9–22; Irma G. Haselwood, 30–53; W. E. Haselwood, 8–13; Mildred E. Hatry, 7–17; Betty Parker Henderson, 27–57; Boyden W. Hindman, 19–29; J. Hoey, 4–4; A. M. Hussain, 3–4; William R. Hutchinson, 9–12; Paul Hynes, 8–16; Herdis Jacobsen, 3–4; Rudolf Jarai, 7–17; Maxine Jones, 5–7; Sadao Jono, 3–4; Florence Jordy, 19–39; Fred C. Kahoun, 4–8; Karl F. Kunkel, 8–17; Rudolf Laflar, 4–5; Warren W. Lewis, 16–26; Roy E. Lindahl, 24–33; Werner Luthy, 4–8; P. F. Lyshol, 10–16; Olav Lystad, 6–9; R. L. Mahon, 24–47; Charles W. Manzer, 37–79; L. McKay, 5–7; Walter V. McKee, 18–30; N. V. Mehta, 4–4; Frank Meister, 10–37; Paul B. Miller, 17–36; Dan Mishler, 8–17; Marian Grace Moore, 10–12; Edmond Moulu, 4–8; David A. Murray, 3–4; Frank A. Noftsinger, 4–7; Silva Nogueira, 6–11; Errol A. Nym, 12–22; Leonard Ochtman, Jr., 6–9; Antonin Olmer, 3–5; Jaroslav Pacovsky, 4–5; Kanti A. Patel, 28–37; D. Ward Pease, 24–41; K. F. Pesak, 14–19; Karl Pollak, 4–6; Lin-Yu Pun, 6–8; Yet-Pore Pun, 13–17; S. V. Gopal Row, 6–8; C. C. Ruchhoft, 15–25; Jeno Sarkany, 3–7; C. F. F. Schaepman, 17–31; H. J. Schmidt, 6–7; T. H. Schuelke, 9–21; Joseph Seidl, 12–15; Tsze-Kong Sit, 11–18; Victor Skita, 7–7; Dr. Wm. F. Small, 26–40; Wm. F. Sminkey, 10–19; Lawrence M. Spaven, 6–15; Wm. Spicer, 10–15; Morton Strauss, 7–15; Rudolf Dir. Sulke, 10–25; W. Starr Suydam, 4–8; Akhtar K. Syed, 3–4; Dr. Max Thorek, 15–26; H. R. Thornton, 31–85; Dr. Carroll C. Turner, 27–44;

Erno Vadas, 12–28; Vincent C. Vesce, 9–19; Ignacio Barcelo Vidal, 5–7; Quentell Violett, 6–9; John H. Vondell, 4–12; Harry L. Waddle, 40–92; H. W. Wagner, 27–50; J. Phil Wahlman, 10–17; Robt. L. Warne, 4–7; Alfred Watson, 39–79; G. L. Weissenburger, 34–74; F. Eliot Westlake, 28–46; Edwin B. Whitcomb, 13–13; R. Winquist, 9–21; Wing-Cheung Wong, 10–12; Walter F. Wood, 3–5; Jack Wright, 41–113; Francis Wu, 19–49; M. Van de Wyer, 5–6; C. A. Yarrington, 5–10; S. K. Yuen, 5–9; P. J. Ziegler, 7–16.

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GEORGE F. JOHNSON, APSA
Forestry Bldg., State College, Penna.

The Detroit Photographic Guild has assembled a slide show of 2 x 2 transparencies giving a brief portrait of Detroit. There are 100 slides in this set, complete with tape recording or typed commentary, whichever is desired. The set is being loaned to camera clubs affiliated with PSA, for a maximum period of one week. If your club is interested contact Leonard A. Thurston, 1356 Division Street, Detroit, Michigan.

Santa Barbara Regional

Merle S. Ewell, Color Division national committee member, Los Angeles, California, has been designated color chairman for the Santa Barbara Regional PSA Convention, June 8–10. Mr. Ewell is arranging several outstanding color features for this program, one of which will be the showing of the accepted slides of the El Camino Real International Color Slide Exhibition in Santa Barbara on the evening of June 10.

New Type of Award

The Triangle Camera Club which meets at the Downtown YMCA in Los Angeles has developed a unique new color award for winners of their club competitions. The following is a quotation from an article in their publication, "Free Lancer," as written by its editor, Irene Blachut:

Through the ingenuity of Dick Schnetzer, program chairman, color slide award winners now have a simplified way of showing off their honors. It is a boon to those photographers who inadvertently misplace award ribbons and the corresponding slides.

This award is a printed certificate 3½" by 8¾" with space on the right or at the top to mount a 2½" by 3½" color print of the winning transparency. There are two types of certificates, one for horizontal and another for verticle slides. The club members receive the certificate and print through the courtesy of the club.

Triangle Club members are enthusiastic over these new awards and with this new inspiration in their hobby, one can be assured that they will vie for possession of them. Triangle hopes that their enthusiasm may be contagious and the use of this certificate will be adopted by other camera clubs.

The writer has seen this in use for several months and thinks that it is a fine idea which any color slide group might do well to adopt if they wish something different in the way of awards for winners.—MERLE S. EWELL.

Slide Study Groups

The Slide Study Groups were set up by the Color Division for two purposes: First, to give members an opportunity to show what they could do photographically and have this work criticized by fellow enthusiasts; second, to afford an opportunity to see the work of others. There is no fee charged for Color Division members.

These study groups are more than an opportunity, they are a challenge. It is a challenge to join a group that requires you to produce four new slides every four months that are an improvement over your previous offerings. By creating an awareness of what is being done by other color slide fans, the members of each group are led toward new goals and by uninhibited criticism they are dissuaded from copying the work of others.

A study group can only be a success if it encourages each member to develop his or her own photographic philosophy. It must help the member to use the camera as a tool with which to express an opinion or convey to others something he has seen. Before we can use a camera as a means of expression we must master its technique, just as a painter must master the mixing of paints and use of a brush. For those who have less experience, study groups are a fine chance to ask questions of picture takers who have already climbed the path toward technical proficiency.

A closed slide study group, made up of 40 2 x 2 slides (four from each of ten circuit members), works as follows:

1. A card is received by the circuit director, indicating the desire to join such a circuit.
2. Four mimeographed sheets with space to record the data for the first four slides to inaugurate activity in a study group, are mailed.
3. These forms are filled out and returned to the circuit director with four 2 x 2 slides, titled, spotted, and in glass. Larger transparencies may be unmounted.
4. When 40 slides have been received, a circuit is formed and routed to each participant.
5. A routing list is placed in a comment notebook. After keeping the set for not over six days, the set is sent prepaid express to the next member on the list.
6. While in possession of the slides, the member views them and makes careful, honest appraisals of all the slides, writing comments in the notebook.
7. The slides are evaluated on a point system and a sticker awarded for the best slides.
8. On the second and succeeding rounds each member replaces his slides with four new ones and adds new data sheets.
9. At the completion of each round, the study group slides are mailed to the group commentator who evaluates other criticisms and adds his own comments. For commentators, we have such men as Jack Cannon, H. J. Johnson and Charles McKee.

Yes, these men and your fellow study group members can help you. By offering an opportunity to inspect the work of others and to have your own work criticized, the Color Division slide study groups provide a means of stimulating your photographic thought and developing your use of a camera as a tool of expression. For more information, write to Dennis W. Pett, 1415 East 3rd Street, Apartment W. 326, Bloomington, Indiana.—DENNIS W. PETT.

Daylight or Tungsten Film?

Although the makers of Kodachrome specify that daylight film is best for sunlight and artificial light film is best for tungsten, still they state that artificial light film makes quite satisfactory pictures with sunlight if a Type A (Wratten 85) filter is used. They also state that for scenic photography taken at high altitudes, Type A film with Type A filter will give better penetration of atmospheric haze and improve the color of distant objects better than daylight film with a haze filter. This is certainly worth noting.

The only drawback Eastman mentions is that some subjects do not photograph as well under overcast conditions with Type A film and filter as they would with daylight film. Also, that a filter may fade if subjected to sunlight for a long period. These drawbacks are not very serious and can be guarded against. I have made many shots with daylight film, also artificial light film using the "A" filter, and I am unable to see any difference in the results, except greater clarity in distant scenes such as mountains, when using "A" film with an "A" filter.

Now here are the advantages of using artificial light film: It can be used with flash and flood at night with a Weston rating of 12, or with type A filter in sunlight with a Weston rating of 8, which is the same speed as daylight film. Also, blue flash and flood can be used. This is a decided advantage as we can take our daylight shots at the usual speed of eight and get splendid results and when night shots

are needed we are loaded with a film of a higher speed. This saves having two cameras and buying both kinds of films. As for using blue lamps, I made a shot of a spray of crabapples, using two blue floodlights, and the transparencies were accepted by El Camino Real, Philadelphia, and New York international exhibits.

There is only one thing to guard against, do not forget to put your filter on for daylight, although there are some subjects which will turn out better without the filter. I have made a number of transparencies with a blue cast; one of the Santa Barbara Mission has the cool atmosphere and deep blue skies which is liked by nearly every one more than the usual warmer tones.

Another time I made a picture of Mount Shukshan in Washington State. The mountain was reflected in a small lake and was a wonderful shot. I leaped out of the car even though I had plenty of time to take the picture. In my hurry I overlooked the filter. The picture I got is one of my most prized mountain pictures and when thrown on the screen always brings an exclamation. It is all blue and I call it "Shukshan and Moonlight." The same scene on daylight film would be quite ordinary.—Alfred Renfro.

Book Banter

As a result of recent additions to the Color Division Library, many members have been requesting loans of the new books. With this normal expansion of the library service, we have had some interesting letters from Color Division members. Many have written to express their appreciation for having had the opportunity of borrowing books which are not ordinarily in stock at book shops and photo supply dealers.

One of the books which has been especially well received is "You Don't Know What You Like" by Fredrick Taubes. This treatise on art was donated by H. J. Johnson, FPSA, of Chicago. Here is a book well worth reading, since there is much the photographer can learn from the artist. This is especially true when the cameraman's medium is color film. As a photographer you may not agree with the author in many of his theories. That, however, may be to the good if, in your disagreement, you are stimulated to do something about it.

One Color Division member, after perusing the Taubes' volume, was particularly perturbed when he read the following: "The realist believes that he is after the truth; but he never comes near it. He sees no more than the camera lens sees; and the camera records nothing but the ephemeral surface of things." Our friend (the photographer) found here a challenge to his skill and craftsmanship. With camera in hand, he set out to make pictures which would refute the artist's theory. We have since learned that the stimulus furnished by his disagreement, has resulted in a group of highly creative pictures in color.

Another reader wrote to express approval of the book and felt that the author's handling of his material was "sane and down to earth," and that he had much to offer the photographer. Lucille Pilcher, Color Division member, said all this and more when she forwarded the Taubes' book to the next person on the reservation list. Miss Pilcher was anxious to say "Thank you" in a tangible way, and so generously offered to denote four books on color and art to the library. These volumes are now part of our collection, available to all Color Division members.

At this point, you may suspect that we have an ulterior motive in telling you all this, and we have. The Johnson and Pilcher donations have helped the library grow. You, too, can help in this expansion program. You may have shelved a good book on color, composition, art or kindred subjects which would be helpful to someone. Since you have long since read the book, why not put it to work in our library. Color Division will, of course, continue to purchase the timely new books as they are published. If you have a book you would like to donate, please write to Harry Haimes, 315 West 86th Street, New York 24, New York. Describe the volume briefly and if suitable, we will ask you to send it on.—Harry Haimes.

Coming Color Exhibitions

New York, May 4–7, deadline Apr. 18. Four slides, $1. Forms from Dr. R. B. Pomeroy, 745 Fifth Av., New York 22, N. Y.

Halifax, May 28–June 1, deadline May 1. Four slides, $1 (include exchange on checks). Forms from W. Roy Isnor, 217 Agricola St., Halifax, N. S., Canada.

El Camino, deadline May 22. Four slides, $1. Forms from Merle Ewell, 1422 W. 48th St., Los Angeles, Calif.

Hawaii, July 16–19, deadline June 30. Four slides, $1 (2 x 2 or 2¼ x 2¼). Forms from H. E. Ajamian, 2351 Manoa Rd., Honolulu, Hawaii.

STEREO

By Owen K. Taylor

Because of widespread interest in Stereo photography, the introduction of new equipment, and its use by a considerable number of PSA members, PSA Journal is pleased to announce the inauguration of a new column devoted to this specialized subject and its problems. If readers so indicate through correspondence and questions, we will endeavor to make this a monthly feature. Its future will be entirely in your hands.

After a good deal of search, we were fortunate in obtaining the help and services of the Chairman of the Board of Governors of the Stereo Society of America, Mr. Owen K. Taylor, to start this section. Mr. Taylor is one of the founders of the Stereo Society and a founder and four-time president of the New York Color Slide Club. He has specialized in stereo photography for many years and brings a wealth of information to this department. After the section is organized, we hope to bring you a wide variety of guest columnists and writers. Fred Quellmalz, Jr.

Since our group will include both beginners and more advanced workers we hope that all will bear with us until we can determine what is wanted. In the beginning we shall assume that the technical problems of processing are not needed at this time, because most Stereo fans are producing color and black and white transparencies.

Here are some of the suggested topics to be covered in nearby articles. These subjects suggest themselves as a result of many years (too many) experimenting. Please do write if you feel other subjects are more important for early discussion.

What subject matter makes good Stereos.
How to compose for Stereo viewing.
How to make a good Stereo picture.
How to mount transparencies for hand viewing.
How to mount transparencies for projection.
Hand viewing and the group problem.
Stereo projection and the problems of programing.
Screens for transmitted and reflected imaging. Which is best and why. What materials to use.
How and why we see in three dimensions.
Slide and stereogram circuits and competitions.

As soon as we learn which subjects most readers want first we shall present those most requested. Meanwhile you may want to do some outside reading and for that purpose we shall include reading suggestions and serially make available the complete bibliography of the art of Stereoscopy which The Stereo Society of America compiled for its members.

While there are many books and thousands of articles on the subject of Stereoscopic Photography, the one which has become the Bible of the art was written by A. W. Judge and published by Chapman and Hall in London in 1925. We understand a recent reprint has been made available by the American Photographic Publishing Company which you can get from PSA Journal ($6.75 postpaid), or it may be in your local library. One prolific writer on the subject is Mr. H. C. McKay, whose articles may be found in the monthly *American Photography*.

A number of writers and commentators on Stereo have in the past created some confusion due to faulty use of terms. It will be our aims to clear up those errors and

STEPPING OUT © Arnold Kidson

BOATMAN Eugenia Buxton

ACTION Victor A. Lookanoff

to establish an understanding of correct terminology. Eventually we hope also to establish standards of sizes for transparencies so that the Photographic Society of America may present specifications for American standards and thus eliminate some of the many sizes which have come to us from past years and European workers. All of these things we hope will promote America's use of the Stereo art.

This is just a start. Be sure to send in your suggestions and more serious matter will begin next month.

Exhibition Records

We are pleased to again present the unofficial results of the tabulation of the most prolific photographic exhibitors of the world in the 53 open photographic exhibitions which have been held up to March 1951. As in the past, all open exhibitions which allowed a maximum of 4 prints per entrant, which hung more than 125 prints and which have published catalogues to date are included. Eight exhibitions: Des Moines, Detroit, Manitoba, Conshohocken, Salzburg, Barcelona, Bordeaux, and Brussels are included in this latest tabulation in addition to those reported last month. The following exhibitors have had 40 or more prints accepted:

Name	*Country*	*Exhib.*	*Prints*
Frank J. Heller	USA	51	132
Harry L. Waddle	Canada	42	114
Doris Martha Weber	USA	41	109
Jack Wright	USA	38	105
H. R. Thornton	England	34	86
Eleanor Parke Curtis	USA	29	83
Theodore L. Bronson	USA	35	81
Eugenia Buxton	USA	42	80
G. L. Weissenburger	USA	35	79
Alfred Watson	USA	30	77
J. W. Galloway	Canada	31	66
Charles L. Wilson	USA	26	63
Jose Oiticica, Filho	Brazil	26	60
H. W. Wagner	USA	27	59
Charles Manarer	USA	30	59
O. E. Romig	USA	23	58
Boris Dobro	USA	19	56
Ortiz Echague	Spain	19	56
Erno Vadas	Hungary	19	55
Lowell Miller	USA	21	53
Francis C. K. Wu	Hongkong	23	52
Merrill W. Tilden	USA	26	52
A. R. Casaco	Portugal	29	52
H. R. Hudson	England	18	51
J. Benjamin	England	18	48
James A. McVie	Canada	20	47
Karl Pollak	England	14	46
Allen L. Horvath	USA	16	46
Tibor Csorgeo	Hungary	21	45
Grace Ballentine	USA	18	43
Axel Bahnsen	USA	17	41

PET FISH © Dr. S. D. Jouhar

Print of the

The tenth judging of the Print of the Month Contest was held in Boston, Mass., with the following results announced by judges Cecil B. Atwater, FPSA. Richard C. Cartwright, APSA, Gisela A. Ellis, Lee A. Ellis, APSA, and L. Whitney Standish, FPSA.

Beginners Group, Pictorial Class

1st—Grant Reed, "Please God"
2nd—Larry D. Hanson, "Hen and Chick"

Beginners Group, Action Class

1st—Grant Reed, "Taking the Curve"
2nd—Larry D. Hanson, "Carnival"

Beginners Group, Nature Class

1st—H. J. Mahlenbrock, "Old Mulberry Trees"
2nd—Larry D. Hanson, "In the Doghouse"

Advanced Group, Pictorial Class

1st—Dr. Victor A. Lookanoff, No title
2nd—Dr. S. D. Jouhar, "Pet Fish"

Advanced Group, Action Class

1st—Dr. Victor A. Lookanoff, No title
2nd—Dr. S. D. Jouhar, "Skaters"

Advanced Group, Nature Class

1st—Louis A. Puggard, "All Played Out"
2nd—Miles R. Bleech, "Susie Squirrel"

February Contest

The February Print of the Month Contest was judged at Cincinnati, Ohio, and the judges C. C. Ruchhoft, Bernard G. Silberstein, and James F. Thompson announced the following results:

Beginners Group, Nature Class

1st—Donald Becker, "Night Prowler"

Beginners Group, Pictorial Class

1st—Chester A. Smith
2nd—S. Wayne Smith, "Mt. Tipanargus"

ALL PLAYED OUT L. A. Puggard

Month Contest

Advanced Group, Action Class

1st—Wellington Lee, "Leaping"
2nd—Irving Rosen, "Slam"

Advanced Group, Nature Class

1st—Arnold Kidson, "Stepping Out"
2nd—Clifford B. Paul, "Nature's Jewels"

Advanced Group, Pictorial Class

1st—Eugenia Buxton, "Atitlan Boatman"
2nd—Alfred Hyman, "Taughannock Falls"

THE RULES

1. There is no entry fee.

2. All active PSA members (individuals) in good standing are eligible, including foreign members.

3. Each member may submit one print per month in each class (total of 3 prints —see rule 13.)

4. One competition will be held each month.

5. Closing date for receipt of pictures at PSA Headquarters is the last day of each month. Pictures arriving late will be placed automatically in the competition for the following month.

6. All prints submitted become PSA property. They will *not* be returned.

7. Reproduction rights are granted to PSA when pictures are submitted.

8. For each winning print, a "PSA Print of the Month Medal" will be awarded. Winning prints and pertinent contest data will be printed in PSA JOURNAL as funds and space permit.

9. Winners for the preceding year will be judged annually at the PSA Convention to pick the "Print of the Year" in each class.

10. Pictures by any photographic process are eligible.

11. Print size shall not exceed "8 x 10."

12. Film exposure must have been made by the entrant. Prints may be made by the entrant or by a photofinisher.

13. The following are the classes of entry:

Classes	*Beginner Group* *	*Advanced Group* **
Action	1 medal	1 medal
General Pictorial (scenic, portrait, genre, etc.)	1 medal	1 medal
General Nature (animals, plants, flowers, pets, etc.)	1 medal	1 medal

* Anyone who has not (prior to day of entry) had a picture accepted in an International Salon or Exhibition of Photography is classified as a "Beginner."

** Anyone who has had a picture accepted in an International Salon or Exhibition is eligible only in the Advanced Group. Any beginner winning 3 "PSA Print of the Month" awards automatically transfers to Advanced status.

The December competition will be for Christmas and New Year cards only, according to the following classes.

	Beginner	*Advanced*
Appropriate scenes	1 medal	1 medal
Humor	1 medal	1 medal
Table tops and other synthetic scenes	1 medal	1 medal

14. PSA assumes no responsibility for notifying competitors of arrival of prints. Members wishing such notification should include a stamped self-addressed postal card to be filled in by Headquarters staff. A suggested message is: "Prints for competition arrived on ....."

15. Include the following data on the back of each print entered. Prints without this information cannot be judged.

Maker's name
Maker's address
Group (Beginner or Advanced)
Class (Action, Pictorial, or Nature)

Further data will be requested for winning prints.

16. Send prints to:

PSA Print of the Month Contest
2005 Walnut Street
Philadelphia 3, Pennsylvania

The Print Contest is judged in a different city each month, although all entries are to be sent to PSA Headquarters as in the past. The schedule of judging and the individual in charge follows:

Month	*City*	*Judges and Judging Arrangements*
April	Pittsburgh	O. E. Romig
May	Detroit	Dr. C. J. Marinus
June	Cleveland	Doris Martha Weber
July	Atlanta	C. A. Luce
August	Philadelphia	Charles Heller

LEAPING Wellington Lee

MULBERRY TREE H. J. Mahlenbrock

"PLEASE, GOD" Grant Reed

NIGHT PROWLER Donald Becker

NO TITLE Victor A. Lookanoff

HEN & CHICK L. D. Hanson

National Lecture Program

Those clubs and individuals west of the Mississippi River who received notices of the tour by P. H. Oelman, Hon. PSA. FPSA, had better get into action fast if they wish to be included in Mr. Oelman's tour through the west beginning in May.

Mr. Oelman will be attending the PSA Regional Convention in Santa Barbara, California, in June and will be available, providing his schedule isn't filled, to those groups along his route who contact the Chairman of the National Lecture Program and make arrangements for this very interesting and informative talk on "Photography of the Nude." If your club is interested in this fine photographic feature, don't delay in getting in touch with the NLP Chairman. The time for arranging schedules is very short.

Final arrangements are being made now for the tour of Barbara Green, APSA. Barbara Green has never been on a nation-wide tour; however, she is no stranger to camera fans everywhere due to *The Camera* Magazine. She was an associate editor for several years and in that capacity was able to disseminate her vast knowledge of the photographic art to thousands of readers. Barbara Green has been a favorite speaker before the camera clubs of the east where she has appeared before more than fifty groups, some of them asking her back the second and even third time.

Barbara Green will be on her first tour through the middle-west with her demonstration, "Making New Prints From Old." This has been her most popular lecture and she illustrates it with over fifty salon prints made through the processes she explains. Many people who have heard this talk tell Mrs. Green they would like to see and hear it every year just to remind them of the picture possibilities right at their doorstep.

By the time this PSA JOURNAL reaches you most of the clubs in the mid-west will have received from the NLP information on how to obtain the services of Barbara Green. As individuals you can remind your officers to take advantage of this fine speaker sponsored by the PSA. Have them contact Jack Clemmer, Chairman, National Lecture Program, Box 548, West Richfield, Ohio—at once!

First Brazilian Convention

JOSÉ OITICICA, FILHO

The first Brazilian Covention of Photographic Art took place during the days 8, 9 and 10 of last December, in the city of S. Paulo and in the Foto-cine Clube Bandeirante headquarters.

There were represented eighteen camera clubs from different places in Brazil. It is indeed a very small number, but we hope that after this first Convention the number will grow rapidly.

The highlight of the Convention was the founding of the Brazilian Federation of Photography (Federação Brasileira de Fotografia, or abbreviated F. B. F.). It was the old dream of many Brazilian photographers, a dream turned into reality, thanks to the leadership of the Foto-cine Clube Bandeirante, who made this first Convention a possibility.

The President of the Convention was Nogueira Borges, President of the Foto Clube Brasileiro, from Rio de Janeiro, the oldest camera club in Brazil. A Board has been elected to direct the meetings of the Convention and the same five members of the Board were designated to be the Constitutional Committee to draw up the Constitution and By-laws of the Brazilian Federation, to be discussed and approved at the next Convention.

The outstanding impression gained from the Convention was the spirit of friendship and cooperation that prevailed among those present. It was, indeed, a wonderful lesson to see how people can do a lot when they have in mind the same ideal, and in our case this ideal was to do the most we could about the progress of photography in Brazil.

We had few but interesting papers that were analysed and discussed during the Convention, and some good suggestions and conclusions were drawn from them.

The next Convention has been tentatively scheduled for January 1952 and will be held at the city of Recife, capital of the Pernambuco State, in northeast Brazil. At this Convention many important points will be discussed and voted, including the Constitution and By-laws of the Federation, the organization of its first Directory, and the place of the Federation Headquarters.

PSA Exhibition

The PSA 1951 International Exhibition of Photography will be held at the Detroit Institute of Arts, 5200 Woodward Ave., Detroit 2, Michigan from October 9 through November 4, 1951. Closing date for entries is September 7th.

There will be a Color Division including prints and slides, Pictorial Division, Motion Picture Division, Nature Division and a Photo-Journalism Division. The exhibit, of course, will follow the PSA recommended practices.

Entry blanks can be obtained from Isadore Arnold Berger, Exhibition Chairman, 2200 National Bank Bldg., Detroit 26, Michigan.

"Tops in Photography" Show at Empire State Observatory

"Tops in Photography," the international print exhibit sponsored by the Metropolitan CC Council moved March 19 from its one-night stand at the Hotel Statler in New York City directly to the Empire State Building's Observatory Lounge.

This exhibit plan follows the pattern set last year when the "Tops" show made its debut at the unique exhibit space provided on top of the world's tallest building. The show was on exhibit at the Empire State Building for two weeks.

Salonitis

So you've never made a picture called "Tranquility" or "Mood"? Nor one that you had titled "Morning Mist"? The image of a "Wagon Wheel" has never passed your lens? Big pillars with small figures you have missed?

You've never shot "A Water Lily" or "A Swan At Rest"? And "Ballet Dancer," too, you never did? "Girl With Fan," "The Thinker," or some posies in a vase? Mexico's famed mother-shawl-and-kid?

You've never made a "Pastoral" or "White Sails in the Wind"? Or "Still Life," "Winter's Mantle," "Redwoods Tall"? Or "Man With Beard" or "Sundown," blue-toned "Seascape" or a "Nude"?

Heck, you've never made a salon print at all!

—ALFRED C. SCHWARTZ in Brooklyn, N. Y., CC "*Dodger*"

OFFICIAL NOTICE

In the January 1951 PSA JOURNAL on page 9 you were notified of changes in the By-Laws in connection with the status of Canadian membership. This matter was voted upon by the National Council and was ratified by a majority vote. At the same time the Canadian members voted 99 to 25 in favor of the changes referring to their status.

As a result of this balloting, Canadian membership is now placed on an equality basis with U. S. membership and District Representatives will be elected in Canada.

Since the next election of District Representatives will be in 1952, district representation will be expanded by presidential appointment and approval of the Board of Directors. This procedure is in accordance with the By-Laws.

JOHN G. MULDER, APSA, *President*

SNOW Chester A. Smith

Western Regional Convention

The Western States PSA Regional Convention, to be held at the Mar Monte Hotel, Santa Barbara, Calif., June 8, 9, and 10, promises to be one of the best attended affairs in PSA history.

An outstanding program has been arranged, including such noted speakers as P. H. Oelman on "Photography of the Nude," Fred Bond on color slides, A. C. Shelton on "How to Create in Color" and Howard Colton on "Ektacolor Film." George Allen Young will conduct one of his famous color slide clinics and Pres. Mulder will be in attendance to discuss PSA and its program.

Registration fee is $3.00 and should be sent to the Convention Treasurer, Mr. Shumway Suffel, 338 East Green St., Pasadena, Calif. It is requested that all planning to attend—and attendance is not limited to PSA members—immediately notify Mr. Suffel.

Rochester Regional

The Northeast PSA Regional Convention, held in Rochester, N. Y., March 2–4th, drew more than 250 members. Plant tours, opening of the Rochester International, clinics, movies, demonstrations and technical talks filled the program.

The banquet Saturday night featured a gag talk by the Detroit news photographer, Scotty McGregor, who was introduced as Sir Roger Chisholm, FRPS. Embarrassing questions from the audience revealed his true identity and the fact that it was another P-J Division stunt.

President Mulder presented PSA Service Medals to Beaumont Newhall, curator of George Eastman House, and Howard E. Smith, convention chairman.

The field trip and flight over Niagara Falls was cancelled because of bad weather. However, an alternate program was put on by George Eastman House in the newly opened Dryden Theater.

NEW AIDS—Deschin

(Concluded from page 170)

latter is in place the optical viewfinder magnifies the image to cover the smaller field area. The Nizo has three view finders, for direct viewing, for waist level, and an angle finder for candid movie making. Speeds range from 8 to 64 frames per second and an attachment permits fade-ins, fade-outs, laps, dissolves and other trick effects. Equipped with a coated f/1.9 Schneider lens, the Nio costs $159.50; with a coated f/1.5 Rodenstock lens, $219.

A new 16mm motion picture camera, the 70-DL, which introduces an exclusive new parallax-correcting viewfinder, is announced by Bell & Howell Company, of Chicago. The camera will replace the 70-DA and 70-DE models. In addition to parallax correction, the new viewfinder includes an optical system that is said to give a 500 percent brighter visual image; telescopic-type optics; a focusing eyepiece adjustable to meet individual eye requirements; new clearance for wearers of glasses; professional-type positive finder; three-objective turret, and new measuring mark. With 1-inch f/1.9 Super Comat lens the camera costs $369.95; with 1-inch f/1.4 TTH Ivotal lens, $459.95; with 1-inch f/2.5 Ansix lens, $344.95. All lenses are in focusing mounts.

After many months of planning and preparation, Urell, Inc., Los Angeles X-ray chemical manufacturer, announces a new departure in the presentation of photo chemicals for home processing. The chemicals are now sealed air-tight in cans and protected from contact with the metal by Urell's special plastic innerliner. The innerliner is automatically punctured when the can is opened. In the case of the Rapid Fixer, two agents are packed separately in the same can. The user opens first one end of the container and then the other, and, thus, the solutions are not mixed until dilution. The complete line of Urell solutions consists of Formula 44—Fine Grain Developer, Formula 44R—Fine Grain Replenisher, Formula 50—Film and Pack Developer, Formula 52—Portrait Paper Developer, Formula 72—Universal Developer, Formula 86—Paper Developer and the Rapid Fixer.

Lenses

Burleigh Brooks Company, 10 West Forty-sixth Street, New York City, have been busy introducing new Schneider optics. The principal item is a new Schneider

Ideal for a one man studio is this newly introduced Electronic Secretary, the automatic telephone answering machine. No longer does the photographer out on a job or busy in the darkroom have to miss any telephone calls. The Electronic Secretary answers the phone automatically, takes a message and also tells the caller when you will return or where you may be reached. It is manufactured for and distributed by Electronic Secretary Distributing, Inc., 811-B W. National Ave., Milwaukee 4, Wisconsin. The Electronic Secretary is easily installed as it is not connected to the phone. You just plug it in and use. As an extra feature, the unit serves as a handy dictating machine.

All Wound Up in Red Tape. That's the way Leonard Thurston feels. His business is twine and string and tape—all colors—and now he is in charge of booking the *Dynamic Detroit Color Slide Shows.* If you haven't already arranged to have this splendid thirty-minute Slide Show with Sound Tape Recording for your club or salon showing, be sure to write Leonard Aubrey Thurston, 811 Edison, Detroit 2, Mich., and give your folks a preview of the fine shooting possibilities in Detroit. No cost—only postage to the next club. No red tape either—Leonard takes care of all that! See you in Detroit, Oct. 10–13, 1951. Photo by Walter Pietschmann.

Xenon 50mm f/1.9, which has a diaphragm that closes down automatically to a preset lens aperture. The $133 lens includes a ring for pre-selection of the desired lens opening; a cocking lever for opening the lens fully in order to focus and compose, and a release button for closing the diaphragm. The diaphragm may be closed down either by pressing this button, then operating the regular shutter release, or the two operations may be performed simultaneously by the use of a double cable release.

Another Schneider news item is a series of three Schneider focusing magnifiers. They are the 4X at $9.63, the 6X at $9.98 and the 8X at $10.85. The magnifiers are achromatic lenses with wide-field characteristics and may be used both for examining negatives and in focusing on the ground glass. Because of the height of its barrel, the 4X is particularly suited for use with the Rolleiflex.

And here's another. It's a 135mm f/4.7 Schneider Xenar lens in Compur Rapid shutter with built-in synchronizer and cable release socket attachment. It has speeds from 1 second to 1/400th and delayed action device, and costs $52.75.

Other News

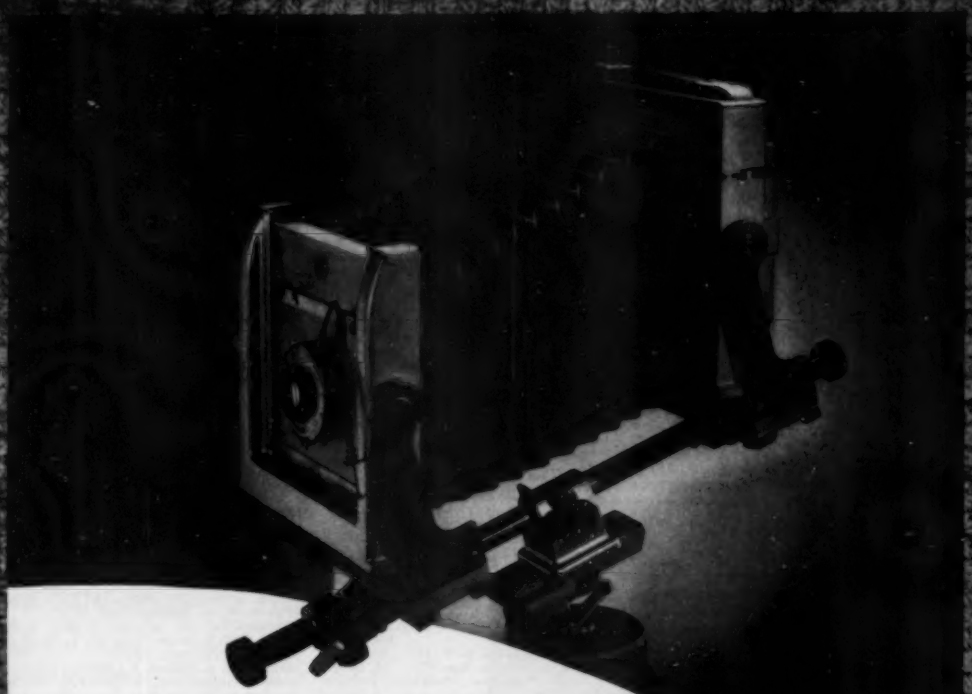
The Leica-Meter, designed to give photoelectric direct exposure readings for the Leica camera, is announced by E. Leitz, Inc., 304 Hudson Street, New York City. The meter, which is $28, complete with case, attaches to the camera's accessory clip and fits the camera both in finish and dimensions. Small, lightweight and compact, the meter has a simplified dial which eliminates the transfer of scale values to a

Two Great Cameras...

There's something about a really fine camera that brings out the best in its user. Pride of possession, awareness of the camera's ability, and an urge to live up to its excellence—all combine to raise your standards, to lift your level of achievement.

Consider the Kodak Medalist II Camera. Every line and detail speaks quality. In your hands, its "feel" and balance are superb. The five-element Kodak Ektar 100mm. *f*/3.5 Lumenized Lens is the finest ever installed on a 2¼ x 3¼ hand camera; and its rigid all-metal double helix mount, hand-lapped to microscopic tolerance, assures you the ultimate in crisp detail in every negative or transparency. Operating convenience is unexcelled, with important automatic features—lens-coupled range finder, parallax correction, film stop, double-exposure prevention, and shutter cocking. An accessory back adapts the camera for sheet film, packs, or plates. For those

Prices subject to change without notice. Consult your Kodak dealer.



. . . to Inspire Great Work

who would enjoy and be inspired by the finest in 2¼ x 3¼ hand cameras, this is the sole choice. With case, $312.50, including Federal Tax.

Or consider the Kodak Master View Camera 4 x 5, above. Here, integrated in one superb functional design, is every operating control the meticulous user could demand—a 360-degree revolving back, center-pivoted horizontal and vertical swings, front and rear transverse slides, front and rear focusing, generous front rise and fall, adjustable center-balancing on a rigid, velvet-smooth monorail, and a uniquely convenient plateholder release. Styling is exquisite, with metal parts in satined aluminum and stainless steel, and a smart gray bellows. Choice of eight superb Kodak Ektar Lenses, from 100mm. *f*/6.3 to 12-inch *f*/6.3. Among 4 x 5 view cameras, this too is the choice for those who demand the best. With carrying case but without lens, $175, including Federal Tax.

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

Kodak

PSA TRADING POST

Open to individual members, free of charge. Limit 25 words each. Copy clears the tenth of the second preceding month before publication.

For Sale—Contax II Sonnar f/2, ever-ready case. Factory reconditioned, perfect, spotless, case shows some wear. $170.00 cash. Madison Gilbert, O. D., Owosso, Michigan.

For Sale—Brand new 12" f4/5 Gundlach Radar lens, coated, in # 5 Alphax Synchro shutter. List price $267.20, will sell for $165.00 or trade toward Saltzman camera stand. Frank McCormick, Box 312, Greenwood, Mississippi.

For Sale—Best offer for Leica II, III, IIIA equipment: Deluxe sliding focusing attachment, chrome angle viewfinder and R. F. prism, chrome rapid winder, chrome adjustable extension tube 40-60mm. All fine condition. John P. Piazza, 500 West Broadway, Haledon, New Jersey.

computer; gives readings in A.S.A. exposure indexes; is keyed to three separate light-intensity ranges; and has a detachable sensitive element that permits overall measurement for exposures from sixty seconds to 1/1000th of a second.

The $47.82 price of the Jen-Flash "Captor" (battery-capacitor type) Synchronizer, designed for the Leica camera, is now $35.50. The price includes the Jen Pak, a scratch-proof metal cover which protects the reflector and permits carrying the entire unit in the pocket.

A kit of paper and filters designed to introduce Varigam variable-contrast paper is now being offered by camera stores. The kit ($2.98) contains a 25-sheet package of 8x10 Varigam; two filters; a filter holder to fit the lens of any enlarger; a sheet of S-55X safelight filter, and instructions.

A new all-steel file for film strips or 35mm negatives has been placed on the market by Brumberger Company, 34 Thirty-fourth Street, Brooklyn 32, N. Y. The file, No. 1032, accommodates thirty-two film strips in individual, numbered compartments, is supplied with an index card, and costs $2.95. A housing to take six of these files is $9.95. A six-drawer cabinet, accommodating a total of 192 cans, is $24.95.

"Functional Photography in Industry," a new 16mm motion picture, is available free of charge from the Industrial Photographic Division, Eastman Kodak Company, 343 State Street, Rochester, N. Y., for showings to technical or industrial groups. The running time is 36 minutes.

A new edition of the booklet, "G-E Photo Lamp Data," is announced by General Electric Company. Copies may be obtained at photography stores or by writing Inquiry Bureau, General Electric Company, Nela Park, Cleveland 12, Ohio. The revised booklet contains new tables of film speed ratings, flash time-light data and lamps for color photography.

And now the photographic industry can say, "Call Me Madam" for we are in the mode. The Fashion Academy's first award in the photographic industry has been made to DeJur-Amsco Corporation of Long Island City, manufacturers of amateur movie cameras. The 1951 gold medal was presented to Ralph DeJur, president of the company, "for originality in design and outstanding fashion styling of its 8mm home movie cameras."

NEW MEMBERS FEBRUARY 1951

New Member	*Nominator*
Alexander, Erich, Detroit, Mich.(F)	L. Cross
Alexander, William, Detroit, Mich.(P)	L. Cross
Alpaugh, Harold, Winchester, Mass.(T),	H. Howell
Anderson, Dr. C. R., Grand Rapids, Mich.(P,T),	J. Armstrong
Atwood, R. F., W. Newton, Mass.(C,P),	L. Ellis
Barna, M. J., So. Hadley, Mass.(CJP)	R. Munn
Bertona, George, Chicago, Ill.(JP)	Membership
Birch, Wm. L., Cleveland, Ohio (T)	R. Langlotz
Blacha, Mr. & Mrs. E. L., Detroit, Mich.(NP),	J. Armstrong
Bolz, Dr. J. A., Grand Rapids, Minn.(P),	L. Hanson
Bryant, Burton D., El Cajon, Calif.(P)	P. Cass
Carey, Hugh M., Guam, M.I.(T)	A. Paul
Castro, Jose R., Havana, Cuba (P)	A. DeMoya
Christierson, K. V., Soledad, Cal.(P),	F. Cancelmo
Cleave, A. S., Wheaton, Ill.(P)	F. Purrington
Clifton, E. L., Simcoe, Canada (P)	H. Waddle
Contreras, E., La Habana, Cuba (CMJP),	A. DeMoya
Crane, J. F., Collingswood, N. J.(JP),	Membership
Crewson, A. L., Cornwall, Cana. (CP),	Membership
Crow, D. R., Chicago, Ill.(P)	Membership
Czajkowski, L., N. Chicago, Ill.(NP),	R. Fullerton
Dennett, R. A., Minneapolis, Minn.(C),	L. Hanson
Desmond, Mrs. A. C., Newburgh, N. Y.(CNP),	W. Small
Dicker, Richard, Fairfax, Va.(CT)	Membership
Donaldson, R. L., Cranbrook, Canada (CMNPT),	G. Hirt
Donovan, Wm. A., Tupper Lake, N. Y.(P),	Membership
Duffy, J. E., Binghamton, N. Y.(T)	B. Landow
Dussault, R. L., Weston, Mass.(T)	H. Howell
Edwards, A. L., Northbrook, Ill.(T)	D. Pritchard
Engelhardt, C. C., Glendora, Cal.(C.N.),	B. Purves
English, H. B., Capetown, S. Africa	Membership
Essock, J. W., Chicago, Ill.(P)	W. Fredrick
Falcon-Uff, P., Romford, Essex, Eng.	Membership
Finne, Mrs. V. L., L. Beach, Cal.(CNP),	M. Ewell
Fleming, Rex J., Santa Barabara, Calif.	B. Dobro
Freligh, C. D., Washington, D.C.(P),	C. Severauce
Fuentes, T. G., San Juan, P.R.(CPT),	Membership
Gill, Frank J., Oil City, Pa.(P),	Rev. Bielenberg
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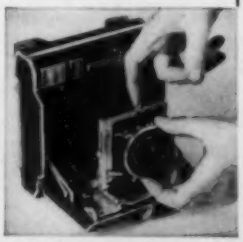

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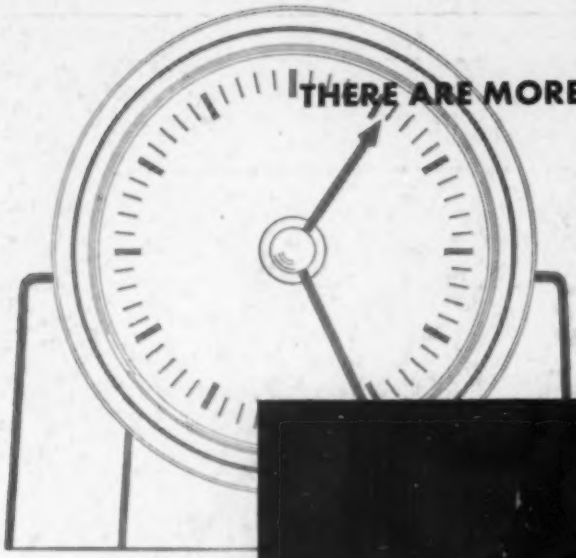

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PHOTOGRAPHIC SCIENCE AND TECHNIQUE

A quarterly technical supplement to PSA Journal

SECOND 1951 ISSUE ☆ PUBLISHED WITH VOLUME 17, NUMBER 4 ☆ APRIL 1951

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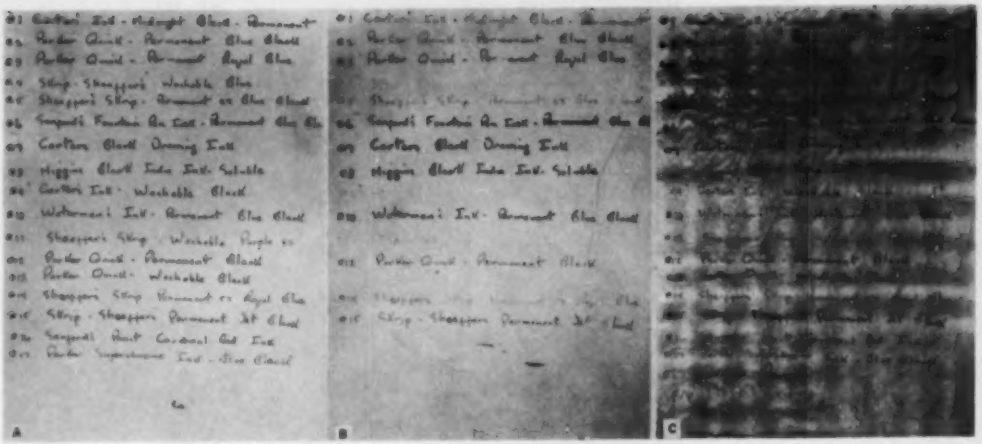

INFRARED PHOTOGRAPHY

THE technical scope of the Document Examiner has been substantially increased through the development of infrared photography. Originally intended for use by physicists and astronomers, infrared-sensitive films proved to be superbly adapted for the examination of physical evidence. The selective penetrating properties of infrared radiations made it possible to detect, record, and demonstrate numerous evidentiary conditions. Also, its efficiency for many purposes resulted in the simplification or supplanting of established procedures.

Infrared photography has a wide range of applications and is especially effective with dark, transmissible or reflecting substances. Through the unique behaviour of this medium: (1) Similar appearing inks are differentiated and identified as to general type. (2) Various dark markings and substances are differentiated, lightened or filtered out. (3) Obliterating matter such as overwriting, colored printing, rubber stamp impressions, dirt, grease, etc., are filtered out allowing obscured details to be seen. (4) Dark backgrounds are filtered out. (5) Charred writing is deciphered; charred eradicated areas are detected. (6) Mechanical erasures and faint indentations or projections are deciphered. (7) Faint pencil writing and graphite smudges are made to appear more clearly. (8) Many forms of latent and obscure evidence (fingerprints, underpainting, etc.) are brought out.

Technique Controls Results

The effectiveness of the infrared examination depends fundamentally upon sound technical procedure. Through

SECOND 1951 ISSUE — VOLUME 17D, NUMBER TWO — PUBLISHED WITH THE PSA JOURNAL FOR APRIL 1951

PHOTOGRAPHIC SCIENCE & TECHNIQUE

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PHOTOGRAPHIC SCIENCE AND TECHNIQUE is prepared four times yearly for the Photographic Society of America by its Technical Division. It is published as SECTION B of PSA JOURNAL and is mailed without additional charge to all Society members and to JOURNAL subscribers. Separate subscriptions are not available.

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Fig. 4. Various samples of writing inks photographed (A) on orthochromatic film, (B) on infrared film using a Wratten No. 87 filter. In (C) samples 18 and 19 have been added and the paper has been charred by burning. Note that "washable" inks have been altered by burning so that they are opaque to infrared.

Part II Camera Technique

JOSEPH THOLL*

of DOCUMENTS

the purposeful manipulation of copy and lighting, correct focusing of the invisible image, proper selection of filters and careful attention to exposing and developing, infrared photography can be made to yield positive results where, otherwise, there might be failure. Each of these factors forms an integral part of the evidential infrared photograph. Lighting, in a great measure, controls tonal separation, contrast, depth, and affects the sharpness of the image. Critical focus gives the accentuated qualities of sharpness and crispness so vital in forensic photographs. Correct filtering makes use of the most effective wave-length region and is important because infrared films are sensitive not only to invisible rays but to visible light as well. Exposure for the invisible infrared is determined by the unseen photochemical peculiarities of a subject. Processing may be curtailed or extended, to produce flat or contrasty results according to the contrast requirements of the subject. Each of these factors is separately discussed.

Camera Equipment

Conventional equipment was used for making all of the illustrations. In this type of work it is the technique rather than fancy gadgets and costly apparatus which counts. Two cameras were utilized, a 4 x 5 Speed Graphic and an 8 x 10 view camera with a 5 x 7 reducing back. The film holders were a standard type whose slides bore five embossed dots (manufacturer's indication of infrared opacity). The lenses utilized were a 127 mm Ektar anastigmat, which is standard equipment on the 4 x 5 Graphic, and a 7 inch Taylor, Hobson and Cooke anastigmat (flat field). The tripod was a sturdy folding type with a tilting top for vertical photography.

Studio Conditions

All extraneous light and reflections must be eliminated when copying with infrared else special lightings are nullified or lose much of their effectiveness. Directional and grazing lightings are considerably changed by a relatively small amount of diffused light. Stray reflections, uncontrolled daylight, and other superfluous sources of radiation may adversely affect a situation. Infrared copying is best done in a dark room with non-reflecting walls.

Lighting

The lighting utilized depends on the nature of the evidence to be photographed. Textural and surface details require a lighting that emphasizes contrast and relief. In some cases both of these forms of lighting, the flat and contrasty, are combined for a characteristic effect.

Diffused Illumination

Diffused illumination which favors tonal gradations at the expense of contrast and texture is best suited for recording the photochemical action of the infrared. This lighting is used for: (1) the comparison and identification of

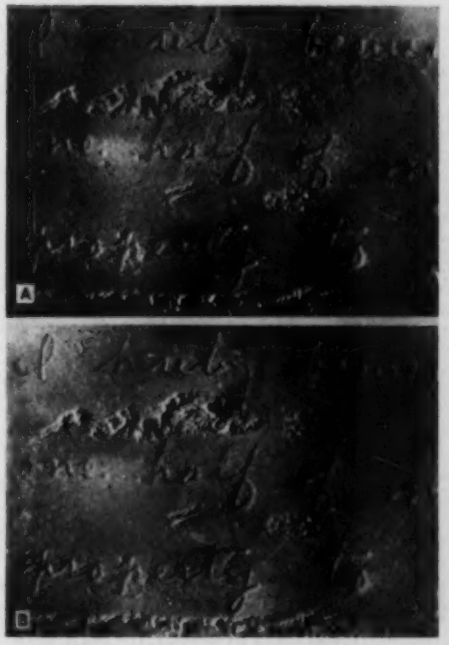

Fig. 1. Infrared photographs of pencil erasure lighted (A) by grazing rays projected from a condenser enlarger and (B) by a combination of grazing light and diffused light from a photoflood lamp at a 20-30 degree angle. Both negatives were developed 6 min. in D-61a.

* Examiner of Questioned Documents, 3260 Cedarbrook Road, Cleveland 18, Ohio. Received 12 February 1951. Part I, dealing with contact techniques in infrared photography of documents, appeared in the February 1951 issue.

inks; (2) filtering out and lightening dark or obliterating substances; (3) the decipherment of charred documents; (4) for maximum tonal separation (not contrast) between similar appearing substances.

Diffused cross-lighting gives maximum tonal separation with little or no textural relief whereas a single, diffused light source (45 degree) combines a fair amount of tonal and textural details. For example, cross lighting will minimize obliterating, distracting surface detail on charred paper to allow the charred writing to stand out. On the other hand the single diffused light source brings out, simultaneously, ink (tonal) and paper (textural) details; in paintings both pigment (tonal) and brush (textural) characteristics are revealed. A thorough examination may necessitate a series of photographs employing several lighting arrangements.

Contrast Illumination

As the illumination becomes more concentrated and focussed it tends to give more textural relief, sharpness, depth and contrast while allowing a lesser degree of tonal gradation. Employed as a grazing light it becomes highly delineative, bringing out surface details through brilliant highlights and hard thin shadows. The grazing light is particularly effective in conjunction with infrared because it gives a more pronounced tonal separation than is the case with visible rays. Grazing illumination and other forms of contrasty, textural lightings are well adapted for the decipherment of depressed mechanical erasures and indentations impressed from another sheet.

To secure an extremely concentrated and directional illumination use was made of a horizontal condensing lens enlarger as a light source. When projected parallel to the surface of the document the rays provided an excellent grazing light. Also when projected from an approximate 70 degree angle and focussed onto the plane of the document, there was produced an extremely sharp, concentrated illumination for general purposes. A lantern slide projector was also utilized as a source of grazing and focussed illumination.

Figure 1A was made with the grazing rays from a 250 Watt spot light lamp projected through a pair of condensers and an f/6.3 flat field lens. The grazing rays have sharply outlined the depressed pencil erasure and the torn paper fibres. In Fig. 1B both grazing and diffused (photoflood) lightings were combined, through separate exposures, to give a somewhat flatter though still legible result. The lighting used in Fig. 1A is best for emphasizing relief whereas the flatter combined lighting of Fig. 1B is better suited for both tonal and textural values. A single photoflood from a 20-30 degree angle will give similar, though less pronounced results (Fig. 8) than the combined lighting shown in Fig. 1B.

Fig. 2. Ordinary and infrared photographs of a ledger sheet charred by fire. Exposure 1 min. at f/16. Diffused cross-lighting. Developed 4½ minutes in D-61a.

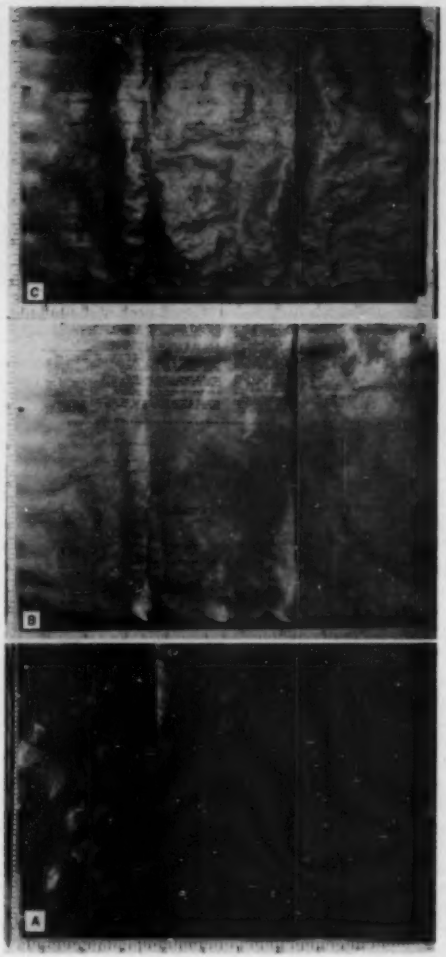

Fig. 3. Fire charred document photographed (A) on ordinary film, (B) using infrared sensitive film, and (C) on infrared film with a white blotter almost in line with the lens.

Focusing

Many forms of latent and obscure evidence can be clearly seen only when the infrared image has been in absolutely sharp focus on the film. Critical focus imparts to hard-to-see evidence qualities of clarity and incisiveness without which they tend to lose their value as forensic exhibits. Where factors such as tonal separation, relative transparency and opacity must be evaluated by a lay court, an almost exaggerated sharpness and crispness become indispensable requirements.

A simple system of focusing the infrared with an anastigmat lens has proven of practical value for the close-up photography of documents. A three or four power magnifier and a transparent area on the ground glass should be used as aids in focusing. The operations are as follows:

(1) Find the critical focus for unfiltered light with the lens opened to widest aperture and mark the camera position with a section of white card on the track. (Focusing from the back is generally more practicable).

(2) Screen the lens with a Wratten No. 25 filter. Move lights temporarily close to the camera (with caution) for a brighter ground glass image. Find the critical focus for the red light transmitted by the filter.

(3) From the position of the white card on the camera track observe the distance of compensating adjustment from *unfiltered to red filtered focus.*

(4) Now rack the camera for an IDENTICAL DISTANCE IN THE SAME DIRECTION as was used from unfiltered to red filtered focus to bring the infrared rays into focus. (If one-tenth of an inch was used for bringing the red rays into focus from the unfiltered position, rack the bellows for an additional one-tenth inch for the infrared).

(5) Reduce the lens aperture (to f/16 for example), return the lights to the desired position and make the exposure.

A camera equipped with a focusing lens-mount can be used. The corrective adjustment for the infrared can be gauged by the degree of turn of the front focusing screw. One can judge the effectiveness of this system of focusing the invisible infrared by observing Figures 1A and 1B.

Adjustments from the visual focus are not necessary with lenses that have been corrected for the infrared. The Kodak Process Ektar lenses are examples of copying lenses that are corrected for the infrared and near ultraviolet.

Filters

In the course of examining various kinds of physical evidence it was found necessary to use filters transmitting wavelength regions from 590 $m\mu$ in the orange-red to 900 $m\mu$ in the infrared. Washable inks and many permanent writing inks show an increasing transmission to the infrared in direct ratio to the increase in wavelength. Washable inks that were completely transparent to the infrared in the 760 $m\mu$ region (Wratten No. 87) were relatively opaque to visible red light in the 590 $m\mu$ region (Wratten No. 25). See Figures 5A, 5B, 5C, and 5D.

Filters should be utilized for specific functions. Heavier filters of the Wratten Nos. 87 and 87c type are most effectual for the elimination or lightening of dark inks and obliterating matter, and for maximum tonal separation in charred documents. The comparatively lighter red filters such as Wratten Nos. 25, 29 and 70 are more practicable for erasures containing imbedded particles of transmissible ink, and generally for purposes where extreme filtering is not desirable.

Fig. 6. Normal and infrared photograph of a receipt suspected of alteration. A Wratten No. 25 filter was used to filter out the red printing and red stamp impression. One photoflood, 5 seconds exposure at f/16, developed 5½ minutes in D-61a.

Exposure and Development

In visible light photography the exposure time is calculated from measurements obtained by use of meters that are sensitive to the visible rays. With infrared films the exposure is determined by the effect of the invisible infrared radiation on the film itself. This can only be ascertained experimentally. A dark surface like moderately charred paper which reflects infrared may take a comparatively short exposure while another shade, such as a pigment of equal visual density, with a high relative infrared absorption may require a considerably longer exposure to record detail. Then again, *well* charred documents will take an extended exposure while a smear of black washable ink needs a very short one. Where the exposure is in doubt trial exposures must be made to observe the action of the infrared.

The processing of the exposed infrared film depends on the amount of exposure given and the inherent contrast of the subject. Subjects of high inherent contrast require a curtailed development (75% normal) in a flat-working formula whereas subjects of low inherent contrast need full development in a strong-working formula. Several intermediate degrees of processing can be utilized to control the contrast.

Applications

Charred Documents

The decipherment of charred documents by infrared photography is a possibility so long as there is some physical difference between charred paper and writing residue. Failure will be encountered where there is complete, over-all carbonization or insufficient residual writing traces. On the other hand failure may be due to use of the wrong filter, inadequate lighting, or insufficient exposure

The fact that charred paper is rendered as a light shade and charred writing as a dark one, indicates that the former more or less reflects infrared while the latter absorbs it (Fig. 2). This dual process of reflection and absorption results in a degree of contrast that is determined by three factors, namely, (1) the extent of charring of the paper, (2) the amount of ink residue, (3) the length of the exposure. The effects of these conditions was borne out by experiments which showed (Fig. 3) that charred paper, because of its reflective behaviour could be: (a) overexposed like any light surface; (b) made to reflect even reflected diffused illumination; (c) made more legible through increased exposure.

Moderately charred documents (dark brown) containing clear traces of writing or printing possess a high inherent contrast and need diffused lighting and medium (75%) development. As the inherent contrast decreases because of carbonization and fragmentary writing traces, the photographic contrast should be correspondingly increased by means of added exposure and prolonged development.

Eradicated areas on charred documents that have been subjected to chemical "ink removers" can sometimes be visually identified because of the deep black carbonization on both sides of the document. It was also observed that washable inks, which are ordinarily completely transparent to infrared, became quite opaque through charring (Fig. 4) as well as becoming insoluble in acid reagents.

Charred specimens, if not too fragile, can be made more pliable by immersion in a print softening solution like Flexogloss, or may be mounted in gelatin between glass.

Examination of Inks

The utility of infrared for the examination of inks is based on the characteristic absorption or transmission of the radiation by inks of various chemical composition. Similarities or differences as well as general type are photographically indicated by a light, dark, or intermediate tone on the positive print. Figure 4 illustrates how a number of representative inks appear by visible and infrared photography; in 4C the sheet of specimen inks was charred for experimental purposes with evident results.

Wavelength Region Varies in Effects

The infrared recording of inks varies in its effects according to the wavelength region transmitted by the filter. Permanent inks with a large percentage of highly transmissible provisional coloring, and the washable inks became progressively more transparent as the wavelength was increased; the former became relatively transparent and the latter completely transparent at 760 mμ. (See Fig. 5).

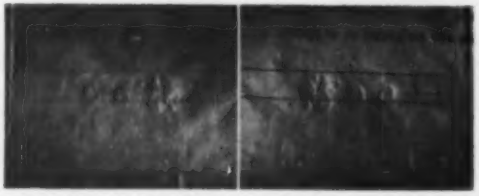

Fig. 8. Opposite sides of a mechanical erasure lighted by an obliquely placed photoflood lamp. Grazing rays would have obliterated some of the finer details.

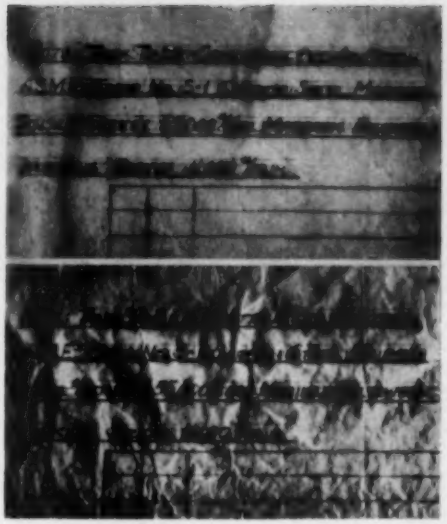

Fig. 7. Two infrared photographs of an erased and altered mechanical drawing that has been badly soiled, worn, and creased. The grazing rays in the lower photograph are less revealing than the 45 degree angle illumination from a single photoflood lamp shown above. Exposed 15 seconds at f/16 using a Wratten No. 87 filter.

Permanent inks with a large percentage of absorbing iron pigment, and highly absorbent carbon inks showed little change except for increased opacity (Fig. 4). Differences in infrared recording of many permanent inks are more apparent when photographed through Wratten Nos. 88 and 87 filters than with the No. 25.

In the examination of inks, filters should be selected for specific functions. The higher wavelengths (710 mμ to 900 mμ) have a cutting action that filters out obliterating matter and lightens backgrounds which do not respond to lower wavelength regions. An even greater degree of transparency can be had through the use of infrared transillumination. The lower wave-length regions (590 mμ to 700 mμ) are very effective for the freely transmitting substances and are employed where extreme filtering is undesirable.

Case Examples

The following court cases involving inks are briefly cited: Infrared photography revealed two distinct kinds of black ink on an altered note that appeared perfect by visual examination. The use of the 760 mμ wavelength region (Wratten No. 87 filter) showed how grades on a high school record were changed from the low seventys to the high ninetys. When the stamped impression and red lettering were removed from an altered receipt important pencilled standards and an erasure were revealed; a Wratten No. 25 proved most effective in this case. (Fig. 6). After a witness in Cuyahoga Probate Court swore that the same inks had been used to write an entire receipt, it was possible to show that interlineations were made with another type of ink.

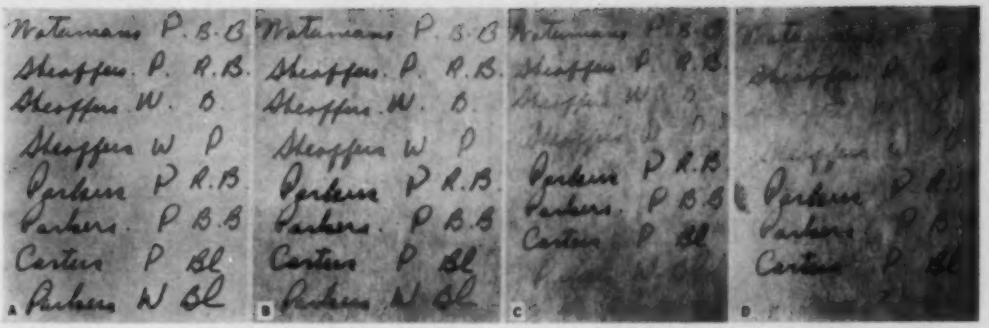

Fig. 5. Writing ink specimens photographed (A) by visible light on panchromatic film, (B) by a combination of red and infrared radiation using infrared film and a Wratten No. 25 filter, (C) on infrared film by infrared only, using a Wratten No. 88 filter, (D) on infrared film by infrared using a Wratten No. 87 filter. The three infrared photographs were lighted by a single photoflood lamp which brings out both tonal details in the inks and structural details in the paper surface. This series illustrates the increasing transparency of certain inks to infrared as longer and longer wave lengths are used in photographing them.

Diffused lighting is most suitable for the infrared recording of inks. Cross-lighting brings out tonal characteristics with a minimum of texture (Fig. 4). A single diffused light brings out both tonal and textural details which may be desirable in some cases (Fig. 5).

To compile accurate and comprehensive data for both laboratory and court use, note should be taken of lighting, exposure, filter, time and temperature of processing, developer and paper used. In the courtroom this information should be on hand for either cross or direct examination since any variability in the above factors would give misleading results.

Mechanical Erasures

The decipherment of mechanical erasures is controlled by three technical operations, namely, (1) lighting, (2) image size, (3) focus. The more obscure the erasure the more critical, of course, are these operations.

The lighting to be used varies with the physical nature of the erasure. Depressed erasures with little or no traces of pigment are best deciphered by concentrated grazing rays (Fig. 1A). Where there are imbedded traces of pigment the combination lighting already described or diffused lighting through a narrow slit may be most effective for bringing out BOTH TONAL AND TEXTURAL DETAILS. With the use of the grazing light exaggerated surface detail may obliterate vital data that would show more clearly with diffused 45 degree light (Fig. 7).

The raised, opposite surface of a mechanical erasure may provide more information than the erasure itself, which may be worn or rubbed down (Fig. 8). Such a condition occurred in a disputed will where the typed word, "all" was erased and the figure, "½" substituted. An infrared photograph of the opposite side made with grazing rays clearly revealed the erased word, "all".

Pencil Writing

Infrared film is better suited than process film for the photography of obscure pencilled documents because it makes the pigment more distinct while retaining the tonal values and detail in the paper. Hence pencil writing and mechanical erasures can be recorded together without obliterating, abnormal contrast. In a court case (Fig. 7) infrared photography clearly brought out faint, worn pencil writing on a much handled and soiled mechanical drawing. A Wratten No. 87 filter was used to bring out the erased pencil lettering.

Halation

To minimize the effect of halation from reflections of transmitted infrared radiation, documents on the copy board should be backed with black paper. Halation reduces sharpness, depth and tonal values. The effects of halation would be most evident through an extended exposure of a transmissible substance and the use of an improper backing. It is also helpful to place black paper behind the film in the film holder, especially in cases where exposures of relatively long duration are required.

NEW BOOKS

The Identification of Molecular Spectra by R. W. B. Pearse and A. G. Gaydon. Second Edition Revised 1950, 276 pages 7½x11. John Wiley and Sons, Inc. 440 Fourth Avenue, New York 16, N. Y. $8.50. Available from PSA JOURNAL, postpaid.

Out of their extensive work with molecular spectra at Imperial College, London, the authors have developed a convenient arrangement of wave length tables divided into two parts.

The first part lists the strongest heads of the better-known band systems of each molecule, in order of wave length, together with information about their origin, intensity in various sources, and appearance.

The second part includes individual lists of band heads for each system of each molecule plus pertinent notes about the system. The scientist can refer to the list for the system he has tentatively identified in the first part as the unknown system and check for the presence of other members of the system until positive identification is made.

This revision of the 1940 edition contains considerable new data as late as November 1949 necessitating rearrangement of the tables in more compact form. Sixty-seven photographs of band systems are presented in 12 large plates.

A THEORETICAL STUDY OF ERRORS OF FOCUSING SCALES

DR. K. PESTRECOV*, APSA

SUMMARY

This paper covers a theoretical study of those errors of focusing that may be caused by incorrect determination of the object to image distance, by mechanical inaccuracy of the focusing scale, or by deviation of the actual focal length of the lens from the nominal focal length for which the scale was computed. Differential formulas are given which permit the computation of focusing errors from the basic data: the focal length, the over-all distance from the object to the camera emulsion plane, and the corresponding focusing shift of the lens.

An attempt is made to evaluate the significance of these errors by their transfer into the object space, and by their correlation with an assumed permissible circle of confusion.

ONE of the basic requirements of any high-quality photographic camera is the ability to focus accurately within the range of object distances for which the camera is intended. This requirement can be met to any desired degree of precision by a point-by-point photographic calibration of the focusing mechanism. Such a calibration, however, is too expensive for use in production of large quantities of cameras for the general market. Therefore, standard manufacturing procedures avoid individual calibration, taking advantage of the fact that focusing errors within a certain range of magnitude are permissible when they do not noticeably affect the final photographic result.

In cameras (or lenses) equipped with focusing scales there are three possible sources of errors in focusing. The first is in discrepancies between the actual object distances and the distances determined and focused upon by the photographer. The second is in mechanical errors of the focusing mechanism or of the engraving on the scale. The third is in discrepancies between the equivalent focal length of the lens installed on the camera and the equivalent focal length for which the focusing scale was computed.

The purpose of this paper is to translate these possible errors into the resulting focusing errors, measured as the differences between the actual position of the optical image plane and the emulsion plane of the camera. The paper is confined to the derivation of some basic theoretical relationships which may be used as a basis for determining manufacturing tolerances. No deductions are, however, offered by the author as to the reasonable magnitudes of these tolerances, because the magnitudes would vary widely, depending on the criteria to be used in defining a satisfactory photograph.

Considering the variety of requirements encountered in photographic engineering and art, the author feels that the use of some arbitrary criteria for establishing the tolerances may result in misleading data. Hence, the evaluation of errors is restricted in this paper to the derivation of illustrative relationships which can be used for computing tolerances, provided certain criteria are chosen. The choice of the criteria, however, is left to the user.

While the theoretical results presented herein pertain formally to focusing scales only, some of the results are equally applicable to errors of focusing that may arise from inaccuracies of a focusing range finder, or of visual focusing on ground glass, or of twin-lens focusing. The possibilities of this generalization of the formulas will be self-evident in the following text.

* Scientific Bureau, Bausch & Lomb Optical Co., Rochester, N. Y. Presented in part at the PSA Convention, Baltimore, Maryland, 21 October 1950. Received 27 November 1950.

Basic Optical Relationships and Sign Conventions

The basic quantities involved in this study are shown in Fig. 1. Here the lens is represented by its front (H) and rear (H′) principal planes. The object plane is O . The actual optical image plane is I ; it coincides with the camera emulsion plane C when the camera is in exact focus. Otherwise, a focusing error e (shown in the subsequent illustrations) is present. This error is considered positive if the actual image plane is farther away from the lens than the camera emulsion plane.

The mechanical distance from the object to the image plane is U . This distance does not enter into the formulas derived herein as they utilize the optical distance u, which is connected with the mechanical distance U by the following relationship:

$$u = U - HH'$$

In this study, U and u are always considered positive. The separation HH′ of the principal planes may be either positive or negative depending on whether the second (rear) principal plane H′ is on the right or on the left of the first (front) principal plane H .

The distance from the first principal plane to the object plane is denoted by s, and it will be known as the "long conjugate". The distance from the front focal point to the object plane is x . In accordance with a commonly used sign convention, these quantities will be negative in this study.

The distance from the second principal plane to the image plane is s′, and it will be known as the "short conjugate". The distance from the rear focal point to the image plane is x′. These quantities are positive. The equivalent focal length f (to be known as the focal length) is also positive.

All these quantities are connected by the following equations:

$$u = s' - s; \qquad s = x - f; \qquad s' = x' + f;$$
$$1/s' - 1/s = 1/f; \qquad xx' = -f^2$$
$$s = -0.5u(1 + A); \qquad s' = 0.5u(1 - A)$$

In the last two equations and throughout the subsequent text the following abbreviation was used:

$$\sqrt{1 - 4f/u} = A$$

In general photographic practice the only quantity which can provide a reliable basis for exact focusing is the over-all distance U from the object to the image plane, as the determination of this distance involves a measurement from the readily identifiable position of the camera emulsion plane. The still widely spread practice of measuring "object distances" from the front of the lens, or its "center", or the estimated position of its first principal plane, is not favorable to exact focusing. The reason for this is that the focusing mechanism usually shifts the lens with respect to the object plane, and, hence, the "object distance" measured from any point on the lens does not remain the same before and after the focusing. Thus a certain discrepancy is introduced even if the photographer uses the same reference plane on the lens as was used by the manufacturer in computing the focusing scale. It has not been the practice, however, to indicate this reference plane on photographic lenses. While errors of focusing resulting from these possible discrepancies are usually of little practical significance, in some cases (short object distances, lenses of considerable over-all thickness) they may be sufficient to destroy the quality of a photograph.

Recognizing the need for a reliable basis for measuring object distances, the American Standards Association has approved two photographic standards[1] specifying the camera emulsion plane as the reference base for measuring object distances whenever the camera provides for interchangeability of lenses.

All the expressions derived in this paper are based on differentiations of the basic equations given above. These differentiations are straightforward. Hence, all the intermediate transformations are omitted and only the final results are given. Anyone acquainted with the fundamentals of differential calculus should be able to verify these results, provided he clearly understands that there may be one or two independent variables among the four basic quantities: s (or x), s′ (or x′), f , and u . Therefore, at the beginning of every differentiation one should establish whether the incorrect focusing involves a change of one or both independent variables, and then differentiate accordingly.

The final formulas are given here in two forms. One form contains only u and f, the two basic quantities without which the computation of focusing errors is impossible. These formulas are ready for use without the determination of any intermediate quantities, but they are still somewhat cumbersome in numerical computations. They can be further simplified by transforming them into the second form containing the value of x′, which is the distance from the second focal point to the image plane, and is also the focusing shift of the lens from its position for an object at infinity to the position for an object at the distance u from the image plane. This simplification becomes effective if a focusing table, listing the values of x′ for a given focal length and the object distances of interest in a particular investigation, is available beforehand.

Considering this necessity as well as the general utility of focusing tables for lens and camera designers and for users, a set of focusing scales for a number of focal lengths and an extended range of object distances is given in this paper (Table 1).

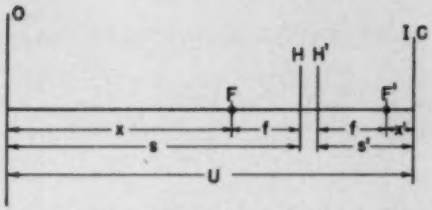

Fig. 1. Basic quantities. Optical object-to-image distance: u = U − HH'.

These tables are "universal" as they involve no other parameters in addition to the focal lengths and object distances, and they should prove very useful not only in the analysis of errors of focusing, but also in preliminary design work and many other practical applications. It should be noted, however, that these tables and, as it was mentioned previously, all the formulas derived in this paper, employ the optical object-to-imagine distance u , instead of the mechanical distance U , which is the distance recommended for the computation of focusing scales and for actual use by the photographer. The following illustrations also show, for the reason of simplicity, only u, and represent the lens as a pair of coinciding principal planes H,H′ .

This omission of the separation HH′ of the principal planes, and the direct substitution of u for U is equivalent to the introduction of an error equal to HH′ in the determination of object distances. Consequently, unless HH′ happens to be equal to zero in a given lens (which would be a rare case), small discrepancies will be found between the focusing shifts listed in the tables and the focusing shifts needed for accommodation of mechanical distances U of the same numerical values as listed under u in the tables. These discrepancies are usually of little significance. Even for lenses of longest focal lengths in use for general photography HH′ seldom may amount to more than a fraction of a percent of the object distance U focused upon. Nevertheless, when precision is required, the separation of the principal planes in the given lens should be determined and the relationship u = U — HH′ should be used in the computation of a focusing scale for that lens.

The use of u instead of U in the differential formulas for errors of focusing is of no consequence as these formulas are only convenient approximations indicating the orders of magnitude rather than the exact values. If the latter are needed, the errors of focusing have to be determined through cumbersome exact computations of the actual s , s′, and u for each correct and incorrect focusing situation. Even in these computations the omission of HH′ hardly ever can be of practical significance.

Reference should be made to a very good recent article by P. C. Smethurst[2] in which errors of focusing are also discussed. The approach by Smethurst to the problem of focusing is essentially the same as in this paper. Here, however, the treatment of the problem is more extended, and the results are presented in generalized formulas not limited to a few illustrative examples.

Table I

FOCUSING SCALES BASED ON OVER-ALL OPTICAL DISTANCE FROM OBJECT TO IMAGE PLANE

	Focal length, inches									
u, feet	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	Focusing shift (x′) of the lens, inches									
0.5	0.0505	0.2679								
1.0	0.0228	0.1010	0.2574	0.5359	1.0505					
1.5	0.0147	0.0627	0.1515	0.2918	0.5000	0.8038	1.2574			
2.0	0.0109	0.0455	0.1077	0.2020	0.3348	0.5147	0.7540	1.0718	1.5000	2.1010
3.0	0.0071	0.0294	0.0683	0.1255	0.2029	0.3031	0.4288	0.5836	0.7721	1.0000
4.0	0.0053	0.0217	0.0501	0.0911	0.1458	0.2154	0.3010	0.4041	0.5263	0.6697
5.0	0.0042	0.0172	0.0395	0.0715	0.1139	0.1672	0.2321	0.3095	0.4002	0.5051
6.0	0.0035	0.0143	0.0326	0.0589	0.0934	0.1366	0.1890	0.2510	0.3231	0.4059
8.0	0.0026	0.0106	0.0242	0.0435	0.0687	0.1001	0.1379	0.1822	0.2334	0.2917
10	0.0021	0.0085	0.0192	0.0345	0.0544	0.0790	0.1085	0.1430	0.1827	0.2277
15	0.0014	0.0056	0.0127	0.0227	0.0357	0.0517	0.0708	0.0931	0.1185	0.1472
25	0.0008	0.0034	0.0076	0.0135	0.0212	0.0306	0.0418	0.0548	0.0696	0.0862
50	0.0004	0.0017	0.0038	0.0067	0.0105	0.0152	0.0207	0.0270	0.0343	0.0424
100	0.0002	0.0008	0.0019	0.0033	0.0052	0.0075	0.0103	0.0134	0.0170	0.0210
200	0.0001	0.0004	0.0009	0.0017	0.0026	0.0038	0.0051	0.0067	0.0085	0.0105
500	0.0000	0.0002	0.0004	0.0007	0.0010	0.0015	0.0020	0.0027	0.0034	0.0042
1000	0.0000	0.0000	0.0002	0.0003	0.0005	0.0008	0.0010	0.0013	0.0017	0.0021
2000	0.0000	0.0000	0.0001	0.0001	0.0003	0.0004	0.0005	0.0007	0.0009	0.0010
Infinity	0	0	0	0	0	0	0	0	0	0

u = optical distance = mechanical distance minus separation of nodal points

Error of Focusing Caused by an Incorrect Determination of the Object Distance

The photographer determines the object to image distance with an error e_u (negative in this case), and sets his focusing scale correctly for an incorrect object distance $u_w = u + e_u$, and, consequently, for an incorrect long conjugate $s_w = s - e_u$, where s is the actual distance from the lens to the object plane 0. This situation is illustrated in Fig. 2. In this case, s is the only independent variable, and the error of focusing e is determined by the following equation:

$$e = ds' = \frac{\delta s'}{\delta s}\, ds, \text{ where } ds = e_u$$

The differentiation results in the following formula for the error of focusing:

$$e = \frac{0.5u\,(1 - A) - f}{0.5u\,(1 + A) - f}\, e_u = \frac{x'^2}{f^2}\, e_u$$

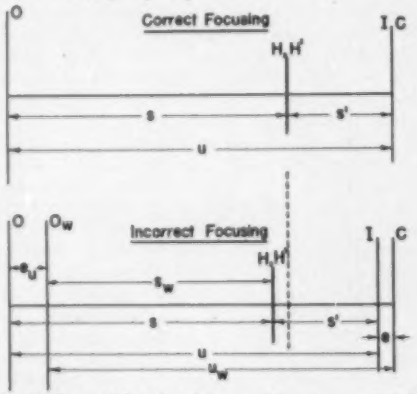

Fig. 2. Error of focusing (e) caused by an error (e_u) in determining the object distance.

If the object distance u is considerably greater than the focal length f, the value of A becomes nearly equal to $1 - 2f/u$, and the focusing error e becomes zero. This indicates that the same error in determining the object distance is of more importance for near distances than for far, which is a fact easily discernible in a direct inspection of the values of x′ listed in Table 1.

The approximation given by the differential formulas for this error should be entirely sufficient for any reasonable situation that may be encountered in actual practice. This may be illustrated by the following example.

If the focal length is 2 inches, and the distance from the object to emulsion plane is 60 inches, but the photographer erroneously determines this distance as 54 inches and sets his lens accordingly, the exact computed error of focusing is $e = -0.0086''$, while the differential formulas give $e = -0.0077''$.

Error of Focusing Caused by Mechanical Inaccuracy of the Focusing Scale

The situation is illustrated in Fig. 3. Here, due to a mechanical error e_m (positive in this case), the long conjugate differs from its correct value by $ds = e_m$. The error of focusing is:

$$e = du = \frac{\delta\,(s' - s)}{\delta s}\, ds, \quad \text{where s is the independent variable}$$

The resulting formulas are:

$$e = \frac{uA}{f - 0.5u(1 + A)}\, e_m = \left(\frac{x'^2}{f^2} - 1\right) e_m$$

Two interesting observations can be made from these formulas. The first is that for large object distances (u large, x′ small) the focusing error e is nearly of the same absolute value as the mechanical error of setting, but of the opposite sign (a mechanical error is considered positive if the lens is set farther away from the emulsion plane than it should be for the correct focusing).

Table I (Continued)

FOCUSING SCALES BASED ON OVER-ALL OPTICAL DISTANCE FROM OBJECT TO IMAGE PLANE

u, feet	Focal length, inches: 5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
	Focusing shift (x') of the lens, inches									
3.0	1.2750	1.6077	2.0132							
4.0	0.8365	1.0294	1.2519	1.5081	1.8031	2.1436	2.5386	3.0000	3.5455	4.2020
5.0	0.6253	0.7621	0.9168	1.0911	1.2868	1.5061	1.7516	2.0263	2.3341	2.6795
6.0	0.5000	0.6061	0.7250	0.8575	1.0045	1.1672	1.3466	1.5442	1.7614	2.0000
8.0	0.3574	0.4308	0.5122	0.6020	0.7005	0.8082	0.9254	1.0527	1.1905	1.3394
10	0.2782	0.3344	0.3963	0.4643	0.5385	0.6191	0.7063	0.8004	0.9016	1.0102
15	0.1792	0.2146	0.2534	0.2957	0.3416	0.3912	0.4445	0.5016	0.5625	0.6275
25	0.1047	0.1251	0.1473	0.1714	0.1975	0.2255	0.2555	0.2875	0.3215	0.3576
50	0.0514	0.0612	0.0720	0.0836	0.0962	0.1096	0.1240	0.1392	0.1554	0.1725
100	0.0254	0.0303	0.0356	0.0413	0.0475	0.0541	0.0611	0.0685	0.0764	0.0848
200	0.0127	0.0151	0.0177	0.0205	0.0236	0.0268	0.0303	0.0340	0.0379	0.0420
500	0.0051	0.0060	0.0071	0.0082	0.0094	0.0107	0.0121	0.0135	0.0151	0.0168
1000	0.0025	0.0030	0.0035	0.0041	0.0047	0.0054	0.0060	0.0068	0.0075	0.0084
2000	0.0013	0.0016	0.0017	0.0021	0.0024	0.0027	0.0030	0.0034	0.0037	0.0042
Infinity	0	0	0	0	0	0	0	0	0	0

u = optical distance = mechanical distance minus separation of nodal points

The second is that the error of focusing diminishes with decreasing object distances, and it vanishes for $u = 4f$ (one-to-one imagery), as then x' becomes equal to f, and the expression in the parenthesis becomes equal to zero.

The accuracy of these differential formulas is excellent. For example, for $u = 60''$, $f = 2''$, and $e_m = +0.005''$, the exact value of the focusing error is $-0.0050''$; the same value is obtained also from the differential formulas.

Error of Focusing Caused by Deviation of the Focal Length from Its Nominal Value

It is common practice to design a focusing scale for a certain nominal value of the focal length, and then to use this scale for a range of focal lengths within the tolerances unavoidable in manufacturing. In analyzing the errors of focusing which may be caused by a deviation e_f of the focal length from its nominal value, the following two cases need to be considered.

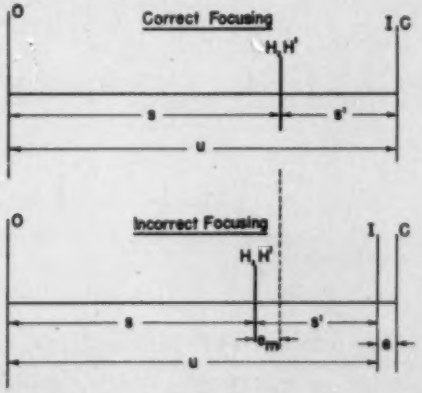

Fig. 3. Error of focusing (e) caused by a mechanical error (e_m) in the focusing scale.

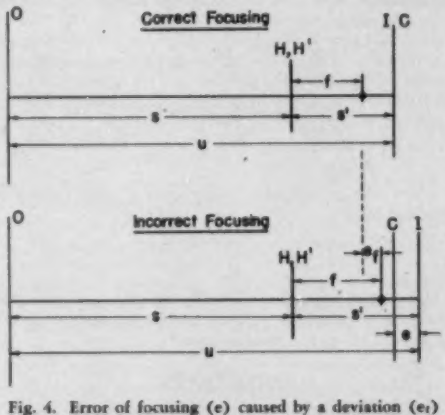

Fig. 4. Error of focusing (e) caused by a deviation (e_f) of the focal length from its nominal value. The lens is not parfocalized for infinity.

a) *The lens is not parfocalized.* If we disregard manufacturing variations in the optical and mechanical parts of lenses and in the registration distances of cameras (an analysis of mechanical errors was given previously), a convenient assumption can be made that, irrespective of deviations of the focal lengths from their nominal value, all the manufactured lenses (of the same construction and the same nominal focal length) will occupy identical positions with respect to the camera emulsion plane and to the object plane. This position is established by the exactly focused lens of the nominal focal length.

The situation is illustrated in Fig. 4. Here the lenses, indicated by the symbol H,H', occupy identical positions. Hence, the long conjugate s is a constant, and the independent variable is the focal length f . Then the error of focusing is determined by the following differentiation:

$$e = \frac{\delta s'}{\delta f}\, df$$

The final formulas are:

$$e = \frac{u}{0.5u(1 + A) - f}\, e_f = \frac{ux'}{f^2}\, e_f$$

When u is much larger than f , the following approximation may be used:

$$e = \frac{u}{u - 2f}\, e_f$$

The accuracy of these differential formulas is usually very satisfactory. Thus, for u = 60", f = 2", and $e_f = +0.10"$ (5% deviation from the nominal value), the exact computations yield $e = +0.1075"$, while the differential formulas give $e = +0.1073"$, and the approximate differential formula gives $e = +0.1071"$.

b) *The lens is parfocalized for infinity.* This case is illustrated in Fig. 5. In the absence of other errors, the parfocalization of a lens, whose focal length differs by e_f from its nominal value, results also in e_f change of the long conjugate. The independent variables are s and f . Consequently, the error of focusing is given by the following equation:

$$e = du = \frac{\delta s'}{\delta s}\, ds + \frac{\delta s'}{\delta f}\, df - ds \text{ , where } ds = df = e_f$$

The resulting formulas are:

$$e = 2\,\frac{0.5u(1 - A)}{0.5u(1 + A) - f}\, e_f = 2\,\frac{(x' + f)x'}{f^2}\, e_f$$

When u is considerably larger than f , the further approximation is:

$$e = 2\,\frac{f}{u - 2f}\, e_f$$

The numerical results that may be obtained with these formulas are usually in entirely satisfactory agreement with the results of exact computations.

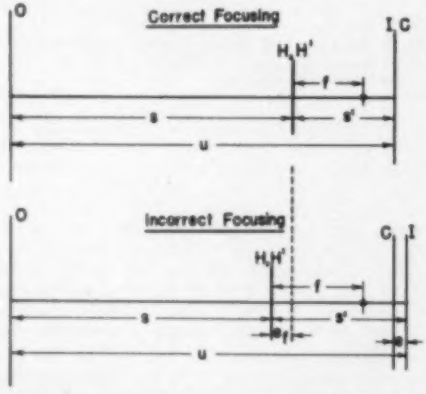

Fig. 5. Error of focusing (e) caused by a deviation (e_f) of the focal length from its nominal value. The lens is parfocalized for infinity.

It is of interest to note that, as may be expected, the error of focusing in the parfocalized case is considerably smaller than it is in the not parfocalized case. The approximate formulas derived for these two cases yield the following ratio:

$$\frac{e \text{ (parfocalized)}}{e \text{ (not parfocalized)}} = \frac{2f}{u}$$

This ratio is very small in most cases encountered in general photographic practice. Thus, with the numerical data used in the preceding example, we find that the error with a parfocalized lens should be only about one fifteenth of the error with a lens that is not parfocalized; this deduction is in harmony with the exact computational result, which gives a ratio of one fourteenth.

Errors of Focusing Transferred into the Object Space

When attempts are made to evaluate the significance of an error of focusing, the most readily understandable interpretation may be found in the value showing the distance between the object plane on which the camera is presumably focused and the object plane actually in exact focus on the camera emulsion plane. The procedure of determining this difference implicitly involves the optical transfer of an error from the image to the object space, or a transformation of an error in the short conjugate into its counterpart in the long conjugate.

The geometry of this transfer is illustrated in Fig. 6. Here the object focused on is at O , and its conjugate image plane is at I ; the error of focusing is e . Consequently, the object plane actually in focus on the camera emulsion plane C is O_c ; the distance from the plane O_c to the plane O "focused on" is E (negative in this case). This distance E represents the error of focusing e transferred optically into the object space.

Differentiation of the basic optical formulas yields the following transfer formula:

$$E = \frac{0.5u(1 + A) - f}{0.5u(1 - A) - f}\, e = \frac{f^2}{x'^2}\, e$$

This formula may be transformed into more illustrative forms by substitution of the previously derived expressions for the error of focusing e . Thus we will obtain the following set of new transfer formulas for the various cases analyzed in this paper.

When an error e_u is made in the determination of the *object distance*, the obvious relationship is $E = e_u$.

In presence of a *mechanical error of setting* e_m , the transferred error of focusing is:

$$E = \frac{uA}{f - 0.5u(1 - A)}\, e_m = \left(1 - \frac{f^2}{x'^2}\right) e_m$$

When u is considerably greater than f , the following approximation holds:

$$E = -\frac{u}{x'}\, e_m$$

The latter expression shows the interesting fact that, within the approximation of the formula, the relative (percent) transferred error (E/u) in the object distance is numerically equal to the relative (percent) error (e_m/x') in the focusing shift x' .

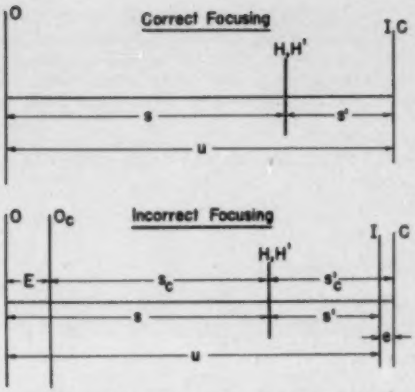

Fig. 6. Error of focusing (e) transferred into the object space. The transferred error in the long conjugate is E.

Taking again for an example a 2-inch lens focused at an object distance of 60″ with a mechanical error of +0.005″, we obtain the following numerical results. The focusing shift for u = 60″ is x′ = 0.0715″ (see Table 1); the error of +0.005″ is 7.0 percent of the focusing shift. The exact value of the transferred error E is — 3.65″ or 6.1 percent of the object distance. The value of E from the differential formulas is — 3.9″, and its value from the approximate differential formula is — 4.2″.

If the focal length differs by e_f from its nominal value, and *the lens is not parfocalized,* the transferred error of focusing it:

$$E = \frac{u}{0.5u(1 - A) - f}\, e_f = \frac{u}{x'}\, e_f$$

Approximately, when u/f is large,

$$E = \frac{u^2}{f^2}\, e_f$$

These formulas should be used with some caution to avoid misleading results. Their peculiarity is that the results obtained with them are generally in good agreement with the exact computations only when the deviation e_f is negative; if it is positive, the reliability of the formulas is limited to the cases when e_f is significantly smaller than x′.

The remaining case, now under consideration, occurs *when the focal length differs by* e_f from its nominal value, *and the lens is parfocalized for infinity.* Then the transferred error of focusing is given by the following expressions:

$$E = \frac{u(1 + A)}{f}\, e_f = 2\left(\frac{f}{x'} + 1\right) e_f$$

And, approximately, when u/f is large: $E = 2\frac{u}{f}\, e_f$.

The approximate formula reveals an extremely interesting and useful relationship. It shows that the relative (percent) transferred error (E/u) in the object distance is independent of the focal length of the lens, and is equal to twice the relative (percent) deviation $(2\frac{e_f}{f})$ of the focal length from its nominal value.

For example, for u = 60″, f = 2″, and e_f = +0.1″ (or 5 percent), the exact computations give E = +5.93″, which is very near to 10 percent of 60″ as predicted by the formula above. The differential formula yields E ≐ +5.8″, and the further approximate formula gives E = +6.0″; both these values are in very good agreement with the exact value.

Finally we may note that the approximate differential formulas just derived show that the ratio of the transferred error in the parfocalized case to that in the not parfocalized case is 2f/u, which is exactly the same ratio as was previously derived for the respective errors of focusing in the image space. For the transferred errors, however, the validity of the ratio is also within the limitations noted above for the transfer formulas in the unparfocalized case.

Correlation of Errors of Focusing with the Permissible Circle of Confusion

While the transfer formulas provide an illustrative basis for determining the significance of errors of focusing, they do not contain in themselves a criterion which would establish the tolerances. Indeed, if, as it was computed in an example, a mechanical error of +0.005″ results, at an object distance of 60″, in a discrepancy of —3.65″ between the object plane "focused on" and the object plane actually in focus, the decision whether or not this discrepancy is disturbing should be made by the designer or photographer on the basis of experience and familiarity with the situations that may be encountered in practice. This decision necessarily involves subjective judgment.

Unfortunately, entirely objective criteria do not exist, and, hence, cannot be offered by the author. The nearest approach to such criteria may be found in the concept of a permissible circle of confusion. If the permissible circle of confusion is reasonably well established on the basis of theoretical considerations or of some experimental data, it can be conveniently used for determining the tolerances for errors of focusing and for the causative errors.

Let c be the diameter of the assumed permissible circle of confusion. Then the following approximate relationship exists between c, the associated error of focusing e, and the f-number F of the lens:

$$e = \pm Fc$$

This relationship establishes the maximum permissible error of focusing for given c and F.

By substituting cF for e in the formulas previously derived, we may determine the tolerances in terms of c and F. Thus, we find the following tolerance for the error e_u in determining the object distance (and also for any transferred error E):

$$e_u \text{ and } E \text{ tolerance} = \pm \frac{Ff^2c}{x'^2}$$

For example, if the diameter of the permissible circle of confusion is 0.001″ (which is a rather strict criterion), the focal length f = 2″, the speed of the lens is f/2 (F = 2), and the object distance is 60″ (x′ = 0.0715″), the resulting tolerance for e_u and E is ±1.6″. This is, of course, a very severe tolerance, which can be liberalized

only by accepting a larger circle of confusion or by stopping the lens down, or by using both these expedients.

Formulas can be derived in a similar manner for tolerances for mechanical errors, and for deviations of focal lengths from their nominal values. The required substitutions and transformations are simple; hence, the derivation of these formulas is left to the interested readers.

The extensive contribution by Miss Beatrice N. Marble to this work is gratefully acknowledged by the author.

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*Photomicrography by Incident Light in Organic High Polymer Research**

ERNST A. HAUSER†

SEVERAL YEARS ago the electron microscope was applied for the first time to obtain photographs of high molecular organic compounds such as, for example, natural and synthetic rubbers deposited on very fine platinum wire gauze from solutions in organic solvents. Although the results achieved offered important information, it could not be denied that the electron bombardment these substances had to undergo during exposure caused drastic changes in the consistency of the sample. Besides this the electron microscope is an instrument which calls for specially trained personnel, its use is expensive and therefore the instruments are not available for many who would be interested in obtaining a deeper insight into the composition and structure of high molecular organic compounds.

Since most of the preparations are opaque, microscopy by transmitted light could not be applied. An ideal solution to the problem was found in the use of the "Ultropak" microscope. This instrument was developed by E. Leitz in Wetzlar, Germany. It differs from a standard microscope insofar as it uses incident light for illumination, as metallurgical microscopes do. However, the "Ultropak" also differs from the metallurgical microscopes in that the rays of light used for the illumination of the specimen are not focussed on the preparations through the objective but through an independent lens ring surrounding the objective. This results in an ultramicroscopic type of illumination. Only light reflected from any discontinuity in the preparation is then reflected through the objective of the microscope into the eyepiece or the photomicrographic equipment. The arrangement furthermore has the advantage that the lens ring surrounding the objective can be adjusted independently of the focal length of the objective, thus permitting the light to illuminate the preparation at an angle most suitable for the condition of the surface under investigation.

This type of illumination also permits studying the preparation under various conditions while it is under observation, as, for example, at varying temperatures if a heatable substage is used. An "Ultropak" microscope equipped with such a substage and a Leica camera casing connecting with a Micro-Ibso attachment is shown in Figure 1.

The "Micro-Ibso" attachment, also developed by E. Leitz, differs drastically from standard photomicrographic equipment. Instead of using a special front lens, the standard microscope eyepiece is substituted therefor. This also serves as the connecting link between the camera and the microscope. Above it, an easily removable prism permits the light entering through the eyepiece to be directed either at right angles into the observer's eye, thus permitting him proper focussing of the preparation, or the light enters after switching the prism out of the light path through a Compur shutter directly into the camera. The Micro-Ibso attachment is so constructed that it can be attached directly to the housing of a standard Leica camera.

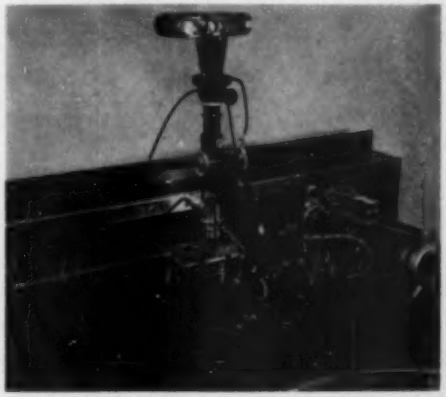

Fig. 1. Ultropak microscope equipped with Micro Ibso attachment, Leica camera casing, and electrically heatable substage.

*Received July 17, 1950.

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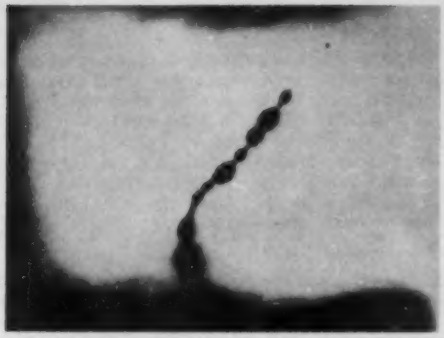

Fig. 2. Balata magnified 2200× without an electron microscope. The specimen shows changes in morphology after heating to 70C on the "Ultropak" microscope stage and immediately cooling when the beaded string breaks. The 1100X microscope record was enlarged 4×, then reduced to make the half-tone printing plate.

In order to be able to make photographs which resemble the preparation as closely as possible it has been found that color film is the ideal medium. Besides fidelity, developed color film has practically no grain and therefore permits extreme enlargements. An enlarged print on bromide paper is then a reversed picture, so to speak, because black areas in the color film will appear white and vice versa.

Figure 2 was made with an actual microscopic magnification of ×1100 and was then enlarged four fold; it is absolutely comparable to what the electron microscope had to offer. Since the development of this technique, it has already offered extremely valuable information in research pertaining to elastic high polymers.

The occurrence of "beads" and their size offer the colloid chemist visual evidence that the high polymer is not of uniform composition. The "beads" represent the low molecular weight fractions of the high polymer, whereas the strands represent the high molecular weight fractions. The large beads indicate a very low molecular weight fraction and their size is a fairly accurate indication as to the molecular weight distribution in per cent. Besides this, the temperature at which these beads occur also offers the first visual proof of how important the molecular configuration of high polymers is in regard to their elastic properties. Balata will only show the formation of beads if the preparation is heated to temperatures above 60C. At this temperature, the long-chain molecules have sufficient freedom of oscillation to overcome the van der Waal's forces preventing the polyisoprene molecules exhibiting trans-configuration from slipping by each other. Natural rubber, which is of the cis-configuration, has no obstruction, however, even at normal temperature and therefore permits the formation of beads much earlier.

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PROBLEMS INVOLVED IN THE RAPID PROCESSING OF ANSCO COLOR DAYLIGHT FILM AND PRINTON

JOHN G. HAINSWORTH*

THE standard processing time for Ansco Color Film and Printon is approximately 90 minutes. The U.S. Air Force, desiring a shorter process using conventional equipment, sponsored research which resulted in a 20 minute process for Ansco Color Daylight Film and a 16 min. process for Ansco Color Printon. The U.S. Air Force will be the first large-scale user of this accelerated procedure employing it in processing 16mm Ansco Color Film exposed in gun cameras. An existing 16mm processing machine was adapted for the rapid processing procedure. The complete process (including drying) requires 31 minutes with that equipment.

Processing Stages Standard 90 min.

The following is a very brief description of the function of each step in the standard processing of Ansco Color Film and Printon.

First Development

The first developer is a metol-hydroquinone developer which produces a *negative* silver image. This step controls, to a great extent, the speed of the film.

First Shortstop

The acetic acid-sodium acetate shortstop rapidly stops development thus enabling precise control of the time of first development. It also aids in the removal of the first developer.

Hardener

A chrome alum solution hardens the emulsion.

Water Wash

The wash removes the first developing agent and other chemicals.

Second Exposure

This produces a latent image in the undeveloped silver halide of the emulsion.

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Delivered at the PSA Convention, Baltimore, Maryland 21 October 1950. Received 18 January 1951.

Color Development

The color developing agent reduces the re-exposed silver halide to metallic silver and is itself oxidized. The oxidized color developer then couples with the dye-forming compounds present in the three emulsion layers to produce a *positive* color image.

Second Shortstop

This acetic acid shortstop rapidly terminates the color developing reaction.

Hardener

The chrome alum solution is used again for further hardening.

Water Wash

The color developing agent is removed from the film at this stage.

Silver Bleach

The silver images produced during both developing reactions are converted back to silver bromide with a solution of potassium ferricyanide and postassium bromide leaving a positive dye image.

Wash

The bleaching solution is removed from the film.

Fixer

The fixer does its normal job of removing silver halide.

Final Wash

Here the residual hypo and any other processing chemicals are washed from the film.

Factors Involved in Rapid Processing of Black-and-White Film

Little has appeared in the literature on the rapid processing of color film. Much has been written, however, on fast processing of black-and-white film. Many of the same procedures and techniques apply equally well to both. A review of some of the more important factors follows.

Ansco Color Printon Time Table for Normal and Rapid Processing

	Standard (Temp. = 68 F)	Rapid (Temp. = 80 F)
1st Developer	14 min.	5 min.
1st Shortstop	2 min.	1 min.
Wash	3 min.	2 min.
Second Exposure	—	—
Color Developer	14 min.	1½ min.
Color Shortstop	1 min.	1 min.
Hardener	4 min.	none
Wash	8 min.	none
Bleach	8 min.	1 min.
Wash	10 min.	¼ min.
Fixer	4 min.	¾ min.
Wash	20 min.	3 min.
Total time	88 min.	15½ min.

Factors Affecting Rate of Development

Alkalinity

One of the most important factors affecting the rate of development is the alkalinity of the solution. At one time the choice of the cation employed was thought to be important[1] but recent publications claim that the pH of the solution is the decisive factor[2]. Hence, the use of a developer with as high a pH as possible is indicated in rapid processing. The upper limit is usually determined by the tendency of the gelatin of the emulsion to soften and reticulate.

Temperature

As with most chemical reactions, temperature has a pronounced effect on the rate of development. The temperature coefficient varies depending upon the developing agent and upon the emulsion used but it is particularly high for hydroquinone[3]. Once again the physical hardness of the gelatin limits the temperature at which a film may be processed.

Concentration of Developing Agent

The concentration of the developing agent has less effect on development rate than either pH or temperature. Concentration is important, however, with respect to the exhaustion life of the developing solution.

Turbulation

Continuous agitation is essential or some method of turbulation which assures optimum processing.

Use of Silver Halide Solvents

Compounds which dissolve silver halides (e.g. sodium thiosulfate, sodium thiocyanate) increase the rate of development[4].

Use of Chemicals Which Swell Gelatin

Urea and similar compounds have been claimed to accelerate development because of their ability to swell gelatin thus allowing more rapid penetration of the developer[5].

Use of Certain Organic Amines as Accelerators

Organic amines, both aliphatic and aromatic, accelerate development[6]. The exact mechanism involved is not definitely known.

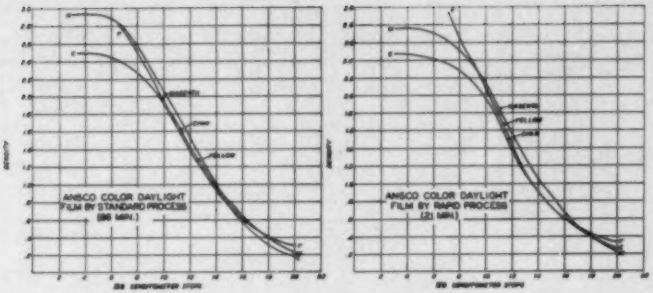
Factors Affecting Rate of Fixing

Increasing the temperature of a normal sodium thiosulfate (hypo) bath increases the rate of fixing. A much more effective way to speed up fixation, however, is to use ammonium thiosulfate[7]. It has been shown that ammonium thiosulfate is approximately four times as rapid a fixer as sodium thiosulfate at a given temperature.

The addition of sodium thiocyanate to an ammonium thiosulfate solution further accelerates the fixing as does sodium cyanide although use of the latter is inadvisable because of its toxicity.

Factors Affecting Rate of Washing

Washing is more rapid following a non-hardening fixing bath than after a chrome or potassium alum fixing bath. The physical hardness of the film is important in this connection as it is often necessary to employ a



Tricolor analysis curves of daylight type Ansco Color Film processed normally (left) and processed by the rapid processing technique (right). Changes in the characteristics of the individual color images due to the rapid processing treatment are negligible.

hardening-fixing bath to reduce swelling and reticulation.

The wash water temperature is very important. For example an increase in temperature from 5 C to 24 C doubles the rate of hypo removal.

The pH of the wash water plays an important part in the washing rate and various authors have suggested the use of an alkaline rinse between the fixing and washing steps[8].

Various hypo eliminators such as ammonia-hydrogen peroxide or sodium chlorite[9] have been used to remove traces of hypo remaining in the film thus effectively shortening the washing period.

Factors Affecting Rate of Drying

The drying of gelatin presents certain difficulties which must be taken into account. If water is removed from the surface at a much greater rate than it diffuses through the gelatin to the surface strains are set up which may cause reticulation[10]. The use of too high a temperature or of air which is too dry may also cause case hardening which actually retards drying.

Hard emulsions dry faster because there is less water absorbed. They also permit the use of elevated drying temperatures.

The use of a saturated salt solution prior to drying has been suggested but although this accelerates the drying, the problem of removing the salt remains.

Rinsing in alcohol also speeds up the drying process[11] but care must be taken in choosing the proper concentration to avoid opalescence in the gelatin or extraction of plasticizers from the film base.

Problems Encountered in Accelerating Each Stage of Processing

A description follows of the problems encountered while attempting to accelerate each stage of processing of Ansco Color Daylight Film (and Printon) and methods developed to solve these problems. It may be mentioned here that during hand processing of cut sheet film in tanks it was necessary to agitate at the rate of 60-100 strokes per minute in order to avoid the formation of streaks, thus requiring some modification of existing processing equipment.

Step No. 1—Prehardening Bath

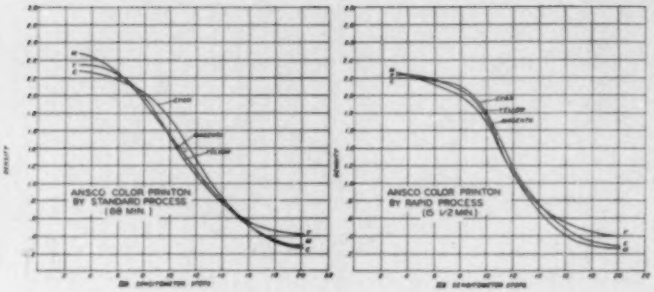
From the foregoing brief review of the factors involved in rapid processing of black-and-white film it is apparent that the harder the emulsion the greater the probability of success in reducing the processing time. Initial attempts to decrease the processing time for Ansco Color Film by raising the temperature of the processing solutions and by increasing the alkalinity of the first developer showed the definite possibility of attaining a 20 minute process but also demonstrated the need for a harder emulsion.

Increasing the physical hardness of a given color film by using a hardener in one or more of the emulsion layers or in an overcoat is a long and involved problem. Many aldehyde gelatin hardeners react with the active methylene groups in the color formers present in the emulsion. Some hardeners cause loss of emulsion speed. The use of aldehyde hardeners in the emulsion may cause fogging and certainly would affect the storage life of the film. These effects would have to be studied at length and as time was an important consideration it was decided to avoid making emulsion changes or modifications.

The need for hardening during processing was therefore apparent. It was soon determined that once the emulsion had been substantialy softened and swollen due to elevated temperatures or caustic developers, it was very difficult to harden the gelatin enough to prevent reticulation during the final wash. Neither chrome alum hardening baths following the developers nor alkaline formalin baths prior to the final wash were capable of adequately hardening the swollen emulsion. A hardening bath prior to first development was thus indicated since the probability of hardening would be greater if swelling had not already occurred.

The first prehardener investigated was an alkaline solution of formaldehyde. Excellent hardening was obtained permitting the use of processing solutions at 120F but the resulting color balance showed a serious loss of yellow and change in the hue of the cyan. Considerable effort was made to overcome this undesirable shift in color balance since an alkaline formaldehyde bath would be an ideal solution to work with from the standpoint of solution stability. No satisfactory method was found for overcoming the several drawbacks of formaldehyde as any method used (high concentration of formaldehyde for short periods; low concentrations for long periods or fuming with formaldehyde gas) produced a very blue color balance whenever satisfactory hardening was attained.

Theoretically the blue color balance caused by formaldehyde prehardeners could be at least partially corrected by using a black and white developer which would develop the bottom (red sensitized—yields cyan) and



Characteristic curves of the three colored layers of Printon processed in 88 minutes (left) using normal processing procedures and Printon processed in only 15½ minutes (right) using rapid processing treatment in solutions at 80F. Slight changes in the separate layers are pictorially unimportant.

middle (ortho sensitized—yield magenta) layers relatively more than the top (un-sensitized—yields yellow) layer. This would produce relatively more yellow dye upon subsequent color development. Various black and white developers were investigated but none was an improvement over metol-hydroquinone.

A similar correction of the color balance could conceivably be produced by the use, in the first developer, of a non-diffusing anti-foggant. This would cause a speed reduction in the top layer thus yielding more yellow dye upon color development. Several compounds were investigated and one showed some promise in this respect. Unfortunately it slowed down the emulsion and required the use of more sodium hydroxide in the developer thus increasing the tendency of the emulsion to swell and reticulate.

When it became apparent that formaldehyde was not readily applicable a considerable number of compounds were investigated as potential gelatin prehardeners. A few of these are listed below along with brief comments.

Compound	*Reason for Trial and Results*
Ethyl trichlorosilane in CCl_4	Reacts readily with OH or NH_2 containing materials. Did not harden gelatin.
Ethyl Chlorocarbonate	Ditto.
Formamide	The carbonyl reacts with active methylene groups. Did not harden gelatin.
Cyanuric chloride	German App. 69,657 claims this hardens film. Did not work successfully.
Reinecke's Salt	Precipitant for amino acids and proteins. Did not harden the emulsion.
Crotonaldehyde	This did harden but fogged badly.
Glyoxal	Hardened the emulsion. See below.

As mentioned above, the one compound which appeared most promising was glyoxal. Initial experiments showed that alkaline solutions of glyoxal hardened gelatin satisfactorily and there was definitely less undesirable shift in color balance than with formaldehyde. There were, however, three disadvantages connected with the use of glyoxal namely: (a) a tendency to cause a yellow stain, (b) a slight reduction of maximum density and (c) a short solution life due to oxidation of the glyoxal.

These three disadvantages of the glyoxal prehardener were overcome in the following ways:

The yellow stain was reduced by the addition of a very small amount of formalin to the prehardening bath. The quantity used was too small to cause any undesirable shift of the color balance.

The maximum density was increased by the addition of an anti-foggant (benzotriazole) to the prehardener.

Inasmuch as the pH of an alkaline glyoxal solution diminishes upon ageing and the solution becomes ineffective as a gelatin hardener in approximately 7 hours, an extended study was made in an attempt to retard this deterioration. Several materials (all boron compounds) were found which extended the useful life of the prehardener from 7 to 30 hours. This solution life is considered practicable as the solution is fairly cheap and a fresh prehardener can be used daily.

A further improvement in the prehardening solution was made by the addition of sodium sulfate. This reduces initial swelling and improves the efficiency of the glyoxal.

The prehardener temperature is maintained at 80 F as are all other solutions and wash water.

It may be mentioned that Ansco Printon, which has a slower and harder emulsion than Ansco Color Daylight Film, requires no prehardening prior to rapid processing at 80 F.

Step No. 2—Rinse

Some method for removing the major portion of the prehardening solution from the film to prevent gross contamination of the first developer is required. In hand operation a dip rinse in a wash tank is adequate. In processing 16mm motion picture film an air squeegee has been used fairly successfully but this is not ideal as the danger of oxidation is increased. A spray wash followed by an air squeegee would be the best procedure.

Step No. 3—First Development

A metol-hydroquinone developer containing sodium hydroxide to increase the pH, sodium thiocyanate as an accelerator, and benzotriazole as an antifoggant to improve the final maximum density, was found to be a useful first developer. It required approximately 6 min. development at 80 F.

Further acceleration by the use of amine accelerators was possible but every compound evaluated caused excessive development of the top layer, resulting in loss of yellow—hence, a very blue color balance.

Two-bath development, in which the alkali and developing agents were in separate baths, was investigated. Once again, the first developing time was reduced but a blue color balance was produced.

The effect of the three major classes of wetting agents

was determined. No useful result was obtained because the wetting agents either precipitated or were ineffective.

Step No. 4—First Shortstop

The only problem at this state was to find a shortstop which worked as rapidly as possible, had a good exhaustion life, and yet did not cause blistering. A sodium diacetate (solid addition product of sodium acetate and acetic acid) solution at a pH of 4.7 gave satisfactory shortstopping action in 1 min. at 80 F.

Step No. 5—Wash

If the black-and-white developing agents are not completely removed by an efficient wash, they will be reactivated in the alkaline color developer. This will cause a speed increase, a contrast increase, and a loss in maximum density and will also contaminate the color developing solution.

Washing for two minutes in a tank containing rapidly-moving water at 80 F is necessary in hand processing.

Step No. 6—Color Development

A color developing solution containing a non-irritating color developing agent and an aromatic amine[12] as a development accelerator, along with the normal alkali, restrainer and preservative, gave satisfactory color development in 4 minutes at 80 F.

This color developing time could not be decreased by further increasing the concentration of the color developing agent because the stain level became intolerable.

Increasing the alkalinity with sodium hydroxide, in an attempt to reduce the time required for color development, actually caused reduction in cyan density. Sodium carbonate at a pH of 10.35 was found to be the most useful alkali.

Sodium thiocyanate, a silver halide solvent, added to the color developing solution in an attempt to increase the speed of the reaction, caused serious degradation of the colors due to proximity development (production of unwanted dye in layers adjoining the one where the dye is desired).

Step No. 7—Second Shortstop

A solution of sodium bisulfite at a pH of 5.5 was found to be extremely useful as a shortstop at this stage because it eliminated the need for a washing step prior to bleaching.

Efficient drainage or squeegee action is necessary to prevent excessive carry-over of the bisulfite into the bleach where it is oxidized, causing a drop in pH of the bleach solution. If the bleach pH does fall appreciably due to this carry-over, the bleaching solution may produce blisters on the film and become more corrosive toward metal tanks.

Step No. 8—Bleach

A ferricyanide bleaching solution of approximately twice the normal concentration gave satisfactory silver bleaching action in 1 min., 45 sec. at 80 F. Further increases in the ferricyanide concentration had little effect.

Other silver bleaching solutions (bichromate, permanganate and copper sulfate) were investigated but found to be inferior to ferricyanide for this purpose.

TIME TABLE FOR RAPID PROCESSING OF ANSCO COLOR DAYLIGHT FILM

	Standard (Temp. = 68 F)	Rapid (Temp. = 80 F)
Prehardener	none	2 min.
1st Developer	16½ min.	7 min.
1st Shortstop	1 min.	1 min.
Hardener	4 min.	none
Wash	3 min.	2 min.
Second Exposure	—	—
Color Developer	16 min.	4 min.
Color Shortstop	1 min.	½ min.
Hardener	4 min.	none
Wash	10 min.	none
Bleach	6 min.	1¾ min.
Wash	5 min.	¼ min.
Fixer	5 min.	¾ min.
Wash	15 min.	1½ min.
Total time	86½ min.	20¾ min.

Step No. 9—Fixer

Ammonium thiosulfate was the most rapid fixer investigated and adequate fixation can be obtained in 45 sec. at 80 F.

Step No. 10—Final Washing

An efficient final wash is necessary to remove the various salts remaining in the film. This can be done in 2 minutes at 80 F in a tank, or even more rapidly if efficient spray washes are used.

Step No. 11—Drying

As the prehardened film is still reasonably hard at this stage, drying can be accomplished quite rapidly. The actual time required depends upon the dryer design.

Conclusion

The aforementioned modifications in solutions and techniques have resulted in a 20 minute hand processing procedure for Ansco Color Daylight Film and one requiring but 16 min. for Ansco Color Printon.

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DAYLIGHT COLOR VARIATIONS *and* COLOR PHOTOGRAPHY

R. H. BINGHAM AND H. HOERLIN*

ABSTRACT

The color of daylight varies according to the hour of the day as well as from month to month but few quantitative data on the magnitude of this variation are available. To obtain information of practical significance, the color distribution of natural daylight has been measured by determining its effect on the individual layers of color film. Photographs of a gray scale under natural daylight illumination were made at various times of the day and for different months of the year and subjected to controlled processing. Observations were made in Binghamton, Chicago, Dallas and San Diego.

The data showed a very close relationship to the angle of the sun above the horizon. At the latitude of Binghamton, New York, the experimentally measured color variations correspond to a color temperature change from 6500 K at noon in June to 5400 K in late afternoon in winter. Nearly the same color range was found to hold for all the four cities studied. Thus the test shows no evidence of a latitude effect other than that from the difference of solar altitude. Daylight color film designed for use at a color temperature of 6000 K will lead to acceptable results over the expected range from 5400 K to 6500 K.

THE color of daylight varies considerably from hour to hour during the day and from month to month during the year. In addition, there are obvious variations due to changing weather conditions. For example, on a partially or totally overcast day the light falling on a photographic subject is usually bluer than that illuminating the subject on a bright sunny day. Probably few individuals are more aware of these facts than the photographer who works with color film. This paper discusses a project which was carried out to obtain quantitative information on the color of natural daylight as it relates to color photography.

The relative amounts of energy present in daylight and sunlight at different wavelengths have been determined quantitatively in the course of scientific investigations by various workers. A review of the extensive literature will not be attempted but the following data from two sources will illustrate the point in question. Figure 1 shows energy distribution curves for pure sunlight, with skylight excluded, as published by Davis and Gibson[1] in 1931. One of these two curves shows the relative amounts of energy in sunlight at noon in June at Washington, D. C., while the other is representative of noon sunlight in December. These curves demonstrate the difference between the blue summer sunlight and the warmer winter sunlight. It should be noted that these data characterize pure sunlight. Daylight, as it illuminates a photographic subject, is a mixture of sunlight, sky light and light scattered from clouds and terrestrial objects. In general, daylight is bluer than the pure sunlight component because of the considerable contribution from the sky.

Figure 2 shows somewhat similar data published by Taylor and Kerr[2] of General Electric Co. in 1941. These curves, representing three phases of sunlight and daylight, perhaps come closest of any published data to telling the amount of color variation which color photographers may expect. The center curve shows the energy distribution of light falling on a horizontal plane on a sunny day. The upper curve is for an overcast day while the lower one is that of pure sunlight.

These curves, together with other similar published data, yield a reasonably good hint of the range of color variation to be expected. The conditions under which these measurements were made, however, are not typical of those that interest color photographers. For one thing, the color film registers the light selectively—it is more sensitive to certain wavelengths than to others. This fact suggests that, in order to determine those daylight characteristics which are of greatest importance in color photography, we should use color film itself as the measuring instrument. Also for photographic purposes other than aerial photography, the most significant measurement of color quality should be made for a vertical, front-lighted surface. We should have data on the color quality of this illumination for different times of day, for different months of the year and for different geographical locations. These considerations led to the formulation of a research project which was planned expressly to yield data on those color variations of natural daylight which are of particular importance for the design of color film and the sensitometric control of such a product.

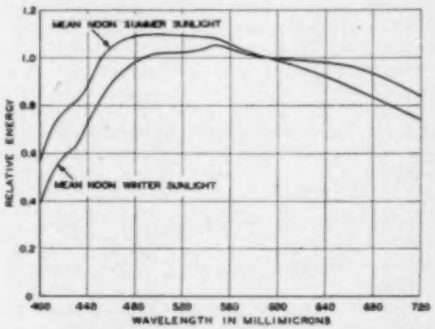

Fig. 1. Relative energy distribution of noon sunlight at Washington, D. C. (Davis and Gibson[1]).

Procedure

The general method was to take a series of pictures of a gray scale chart under widely varying conditions, and to

* Ansco Research Laboratories, Binghamton, New York. Delivered at the PSA Convention, Baltimore, Maryland, 21 October 1950. Received 16 December 1950.

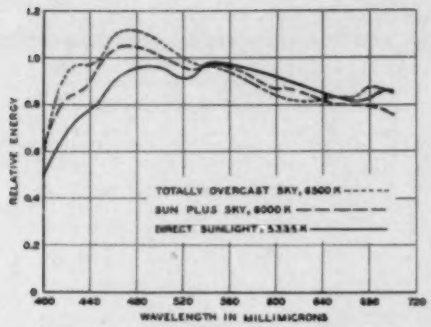

Fig. 2. Average energy distribution curves for three types of daylight at Cleveland, Ohio. (Taylor and Kerr 1941[2]).

process and analyze these pictures together with a number of identically exposed sensitometric strips. From measurements of the integral densities of the gray scale reproductions, the differences in color between various kinds of daylight and the standard light source in the sensitometer were computed.

The typical photographic setup which was used for the out-of-door exposures is illustrated in Fig. 3. An Ansco Titan f/4.5 camera with coated lens was used. The gray scale carried three steps carefuly selected for spectral neutrality. Pictures of the chart were taken on daylight type Ansco Color Film at 1/25 second exposure time with lens apertures at full stop intervals from f/5.6 to f/22. To reduce experimental errors, six rolls of film, that is, thirty-six pictures, were exposed in rapid succession. A typical day's run consisted in exposing in this manner, six rolls of film each hour from eight o'clock in the morning until five o'clock in the afternoon, thus making a total of fifty-four rolls for the day. For control purposes, all these rolls were processed together with six sensitometrically exposed

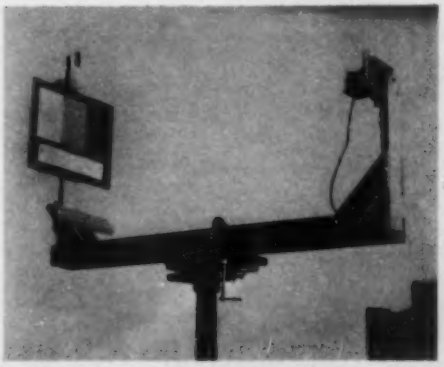

Fig. 3. The simple photographic equipment used for making outdoor exposures. The plumb bob hanging between the first and second gray patches was used to maintain the vertical position of the easel. The shadow of the spike (from which the plumb bob hangs) falling on the plumb line determined the 90° horizontal angle that was used throughout the series of tests.

rolls of the same emulsion number. The intensity scale sensitometer[3] used for exposing the controls operates at 1/20 second exposure time and employs a 2850 K light source with a filter[4] which accurately reproduces the energy distribution of 6000 K daylight.

By measuring the component color densities of the reproductions of the gray scale and comparing them with the densities of the standard sensitometric strips, the color of the light reflected from the gray scale was measured. The details of the method of evaluation were carefully worked out to make the results as independent of camera and film errors as possible. First, the three standard sensitometric curves were plotted from the averaged blue, green and red densities of all the sensitometric strips. A set of curves for one test, Fig. 4, shows blue, green and red densities as read on an Ansco Model 12 Color Densitometer. The color variations of daylight are indicated directly by the color density differences in the gray scale photograph and are independent of the exposure level. It is permissible there-

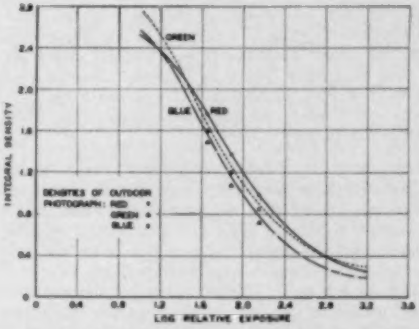

Fig. 4. Density readings, from outdoor photograph of gray scale, superimposed on corresponding complete sensitometric curves.

fore to equalize (superimpose) one of the outdoor picture curves with the corresponding standard sensitometer curve. Then the differences between the two remaining pairs of curves will show the distinction between the quality of the outdoor light and that of the sensitometric source.

The cyan layer, measured by red density readings, was selected as a basis for the evaluation. The procedure may be illustrated by an example in which a three-step gray scale photograph has the following densities:

Step No.	Densities		
	Red	*Green*	*Blue*
1	0.95	0.73	0.84
2	1.36	1.08	1.20
3	1.78	1.50	1.60

Referring to Fig. 4, and assuming the red density curve for the photograph to be identical with that of the sensitometric strip, the green density 0.73 is plotted at the same log exposure level as the red density 0.95. The blue density 0.84 is plotted vertically above it. The points for the other two steps are plotted in a similar manner. This procedure is repeated for the remaining thirty-five exposures and leads to a complete plot of two outdoor characteristic curves.

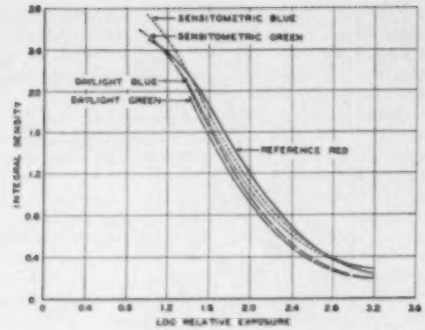

Fig. 5. Typical curves of outdoor daylight plotted relative to the corresponding sensitometric curves.

The resulting curves are shown in Fig. 5. The amount by which the color of the natural daylight differed from the sensitometric standard is measured in log exposure units by the horizontal distance between the blue curves in one case and the green curves in the other. In the example illustrated in Fig. 5, the blue curve shows a log E difference of —0.06 while the green curves differ from the sensitometric standard by —0.04.

Tests of this type were carried out in the vicinity of Binghamton, New York over a period of a year with a total of thirty-two hourly observations on thirteen different days between August, 1949 and June, 1950. In addition field tests were made at Chicago, Dallas and San Diego. In all, a total of fifty-nine hourly observations were made.

From the beginning of these investigations, the possibility was considered that the dominant factor influencing the variation of the color of daylight might be the solar altitude. It was uncertain, however, to what extent other climatic conditions might affect the color of the light*. As more data became available, it became evident that within the errors of the method, and assuming similar weather conditions, the color of daylight is the same at a given solar altitude, irrespective of the time of day and season of the year.

Jones and Condit[5] have published values of the solar altitude for various times of day for successive months of the year. These data which they computed for a latitude of 40° N are reproduced in Table I. In order to convert data of this table to any other latitude (λ) of the north temperate zone, it is merely necessary to add $(40-\lambda)$ to all solar altitude values.

Results

The detailed results for Binghamton are presented in Fig. 6. On these graphs the measured differences of log exposure are plotted as functions of the solar altitude. The upper graph shows that, at the two extremes of twenty and seventy-five degrees above the horizon, deviations in log exposure are + .07 and — .05 respectively for the blue density curve. This means of course that a color photograph taken at a 20° solar altitude will be warmer than one taken at 50° and that the shift of the characteristic curve of blue density will be, on the average, 0.07 which is almost exactly a quarter of a lens stop. The corresponding shift of the green density curve will be about 0.03. Such a color shift would be expected at approximately two hours after sunrise and at about two hours before sunset.

At the other extreme, when the sun is at approximately 75° above the horizon, the daylight is bluer than the sensitometric standard by about 0.05 log exposure units when the densities are measured by blue light, and by about 0.03 measured by green light. Thus noon daylight in June is bluer than the sensitometric standard source by about one-sixth of a stop shift of the blue density curves.

The data for Chicago, Dallas and San Diego are shown in Fig. 7. For comparison purposes the diagonal lines representing the least-squares averages of the Binghamton data are included. It is evident that the data for all four cities

Table I

SOLAR ALTITUDE AT VARIOUS HOURS AND MONTHS AT LATITUDE 40° N.
(After Jones and Condit[5])

	Hours before or after noon, local solar time							
	0	1	2	3	4	5	6	7
June July	73.4	69.1	59.8	48.8	37.4	25.9	14.8	4.2
May Aug.	70.1	66.3	57.6	46.8	35.5	24.0	12.8	
Apr. Sept.	61.3	58.4	50.9	41.1	30.1	18.7	7.2	
Mar. Oct.	50.0	47.7	41.6	32.8	22.5	11.4		
Feb. Nov.	38.7	36.8	31.6	23.9	14.5	3.9		
Jan.	29.9	28.3	23.7	16.7	8.0			
Dec.	26.6	25.1	20.7	14.0	5.5			

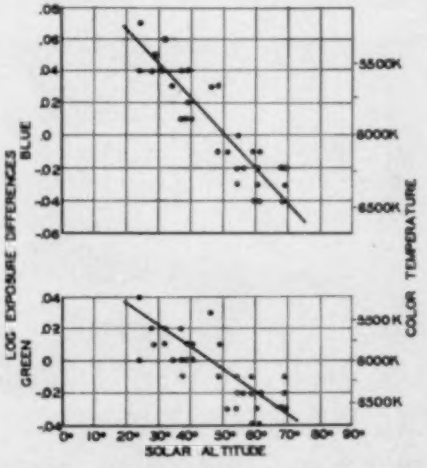

Fig. 6. Color balance of daylight in log exposure differences at Binghamton relative to sensitometric day light 6000 K.

* It is realized that specific local characteristics like reflections from large bodies of water or snow, from lawns, shrubbery and trees or from colored walls of buildings, also effects of altitude above sea level, have to be excluded from our considerations.

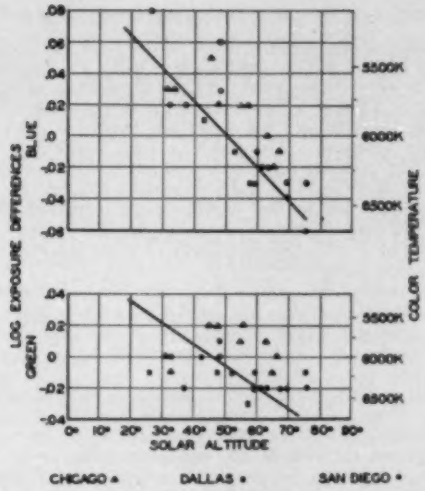

Fig. 7. Color balance of daylight in log exposure differences for three cities relative to sensitometric daylight 6000 K. Average data for Binghamton, plotted as a straight line, has been superimposed.

are in very good agreement. Assuming that these results are typical, it may be concluded that the principal source of variation of the color of sunny daylight is the angle of the sun above the horizon.

The data may also be summarized in a different way as shown in Fig. 8. In order to obtain this curve showing the color temperature of daylight as it depends upon the solar altitude, the log exposure differences were evaluated in terms of relative amounts of energy in the blue, green and red portions of the daylight spectrum. These values were then expressed in terms of color temperature. Note that this graph shows that when the sun reaches twenty degrees above the horizon—about two hours after sunrise—the daylight color temperature is 5400 K; at 50° above the horizon the color temperature is 6000 K. At a solar altitude of 70° representing the extreme limits of our measurements, the color temperature was found to be close to 6500 K.

An example of the application of these results in the case of Binghamton, Baltimore and San Diego is shown in Table II. At these latitudes on typical sunny days, at the indicated times, the light falling on a vertical, front-lighted subject is close to 6000 K.

These results are representative of clear, sunny days. For overcast days the data are less extensive. Nevertheless tests which we have made over a considerable range of solar altitudes show the color temperature of an overcast day to be approximately 6500 K. This color temperature, although at the upper limit, is within the range found for sunny daylight. These data confirm the Taylor Kerr findings (Fig. 2) obtained from photoelectric measurements.

From certain observations, it appears that industrial haze can cause a shift of as much as three or four hundred degrees toward a lower color temperature, particularly in the early part of the morning or latter part of the afternoon.

Table II

TIMES OF DAY FOR 50° SOLAR ALTITUDE

City	Latitude	June 15	September 15	
Binghamton, N.Y.	42°	9:15 A.M.	2:45 P.M.	12:00 Noon
Baltimore, Md.	39°	9:00 A.M.	3:00 P.M.	10:45 A.M. 1:15 P.M.
San Diego, Calif.	33°	8:30 A.M.	3:30 P.M.	9:45 A.M. 2:15 P.M.

Applications to Color Photography

These studies are of considerable importance in the field of color photography for two reasons: first, they form a basis for the design and control of the manufactured product and, second, they contain seeds of good advice on the proper exposure of color film by the consumer. The data show that if color film is balanced to give neutral rendition of a scale of grays iluminated by light of 6000 K color quality, the same film may be used over a color temperature range from 5400 K to 6500 K with entirely acceptable results. Thus, since it is not practicable to make separate films, differently balanced for particular parts of this color range, it is satisfactory to balance to the middle of the range over which most pictures will be taken.

It is obvious that the best time to see, or to photograph, a sunrise is early in the morning. However, the great bulk of amateur color pictures demand faithful hue rendition of flesh-tones, sky, etc. Except for trick shots and attempts at special affects, the conclusions to be drawn from the above data are quite evident.

It follows that daylight color film which is balanced to 6000 K will yield optimum color rendition when used under front lighting conditions on a sunny day with the sun at approximately 50° above the horizon. Pictures taken on overcast days will tend to be about as bluish as those taken in sunshine at noon in June.

Of course, for the interested color photography fan, these suggestions come as a challenge and may well inspire interesting practical tests. To what extent will a thinly overcast sky in fall and winter compensate for the otherwise too low color temperature? Also, is there a period in late afternoon in summer when a thinly overcast sky

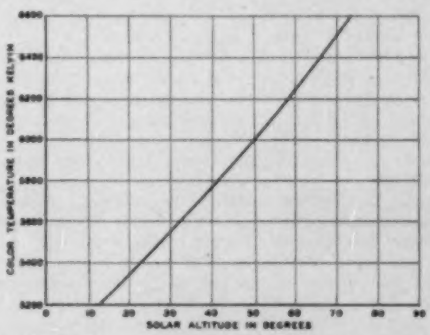

Fig. 8. Color temperature of daylight as a function of solar altitude.

will give good color rendition without the glaring effects of direct sunlight? These questions might also be interesting as they relate to the motion picture photography of babies and small children who often "don't like the sun". Considering also the existence of other local variables mentioned above, it would be difficult to settle these questions in a unique manner. However, the results of this work indicate the answers and may well serve the desirable purpose of tying together practical observations of color photographers generally so that they may all fit into an understandable pattern.

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HOT, COLD, AND INSTANT START LAMPS

Photographers are sometimes confused by the terminology applied to fluorescent lamps. Ralph E. Farnham, APSA, of the General Electric Lamp Department, at Nela Park in Cleveland, Ohio has clarified the matter for Photographic Science and Technique readers in the following statement: "The first fluorescent lamps that we marketed required the external starter and one or two seconds were necessary for the cathodes to come up to temperature and for the starting switch to operate. We now call lamps of this type *preheat fluorescent lamps* as contrasted to the instant-start lamps of which the *slimlines* are typical examples.

"Obviously, the preheat fluorescent lamps are of the *hot cathode* type, since the cathode must be brought up to temperature before the lamp even starts. The cathode then remains at a fairly high temperature because of the arc spot.

"In the case of the slimline lamps, we apply a rather high voltage, 450 and upwards, which is sufficient to immediately strike the arc. The temperature of the arc spot then keeps the cathode hot during operation so that a slimline lamp may be considered as a *cold cathode* start, and a *hot cathode* operate lamp.

"The third group of fluorescent lamps, as well as all neon signs, have rather large cathodes; thus, they are cold cathode start and cold cathode operation lamps. The term 'hot' and 'cold' cathode does not accurate differentiate the instant start fluorescent lamps from the preheat types."

VOLUNTARY PROTECTION OF TECHNICAL INFORMATION*

The Secretary of Commerce requests that the details of this announcement be given the widest circulation through the associations, organizations, and publications with the means to reach those who possess strategic technological information.

Secretary of Commerce Charles Sawyer has provided a service to help the public guard voluntarily against the harmful release of technical information, even though it is not subject to formal security restrictions.

The Office of Technical Services of the United States Department of Commerce will receive requests for advice as to whether specific technical data should be disclosed, withheld, or given limited distribution. OTS will obtain expert opinions from the interested departments and agencies of the Government and inform the inquirer accordingly.

As an industrialist, businessman, scientist, public official, or private citizen, you are invited to use this service whenever you question whether technical information in your possession should be disclosed. It is then entirely up to you whether or not you act on the Government's advice. There is absolutely no compulsion for you to do so, since the program is entirely a voluntary one.

*U. S. Department of Commerce, Washington, D. C. January 1951. Received 20 February 1951.

Requests for advice concerning the release of technical information, together with pertinent manuscripts, plans, or documents, if they are available, should be addressed to:

Office of Technical Services,
U. S. Department of Commerce,
Washington 25, D. C.

Your enclosures will be returned with the Government's comment as promptly as compatible with the problems of fact and judgment involved.

Before inquiries are submitted, the information in question should be considered in the light of the types of technical data and the circumstances with which the program of voluntary protection are concerned. These are discussed in the following.

The Problem and the Need

The Government is fully aware of the dilemma presented by any limitation, even though voluntary, on the

flow of information among private citizens. Free exchange of information contributes to rapid progress in science and industry. On the other hand, all major powers depend on published data for a great share of their strategic intelligence. The present state of emergency, therefore, has directed attention to the security implications of imprudent release of technical information.

The Nation's interests can and should be served by voluntary protection of strategic technical information by private individuals and organizations. The program of voluntary protection is directed toward technical information which, if disclosed, would weaken the total position of the United States more than strengthen it.

What Information Is Affected?

The program of voluntary protection is not primarily concerned with information which is "classified" as restricted, confidential, secret, or top secret by the United States Government. Unauthorized disclosure of such information is forbidden under penalty of law. If a question exists whether certain information is classified, however, this OTS service is available to obtain specific advice.

The program *is* primarily concerned with unclassified technical information and industrial and commercial information of a technological nature. Information falling within the scope of the program includes unclassified technical data on:

Advanced industrial developments.
Production "know-how" and technology.
Strategic equipment.
Special installations.

Circumstances in which voluntary protection is invited are somehow broader than indicated by this listing. The public itself, through inquiries which already have been made of various Federal agencies, has showed its awareness of the dangers of divulging certain information. Those inquiries illustrate certain categories of information regarding which the advice of the Government can prudently be sought:

Collection of Data Which Individually Might Have Little Significance

A major oil company wanted advice on whether to publish a booklet showing the location of its storage facilities throughout the world.

Information Requested Under Unusual or Suspicious Circumstances

A supplier of ordnance received a questionnaire from a broker with respect to his facilities for performing Government contracts. The questionnaire appeared unnecessarily detailed for its stated purpose.

Technical Information as Yet of Limited General Knowledge

A maker of electronics equipment asked whether a proposed radio broadcast on technological aspects of his products would be a security violation.

Inquiries may also be made on the extent of release which may be desirable. For instance:

Should the information be given only limited distribution?

Should part of it be distributed if part is withheld?

What distribution could be considered prudent?

How the OTS Serves

The Office of Technical Services, John C. Green, Director, was designated by the Secretary of Commerce to serve as a clearing house in the program of voluntary protection of technical information because of its experience in publishing technological information developed in Government agencies or obtained from other countries. For some time OTS has acted unofficially as a clearing house for miscellaneous requests of the types contemplated under this voluntary program.

In conducting this service, OTS will refer inquiries to one or more agencies expert in the particular field, assemble the comments, and forward the Government's advice together with any original materials submitted by the inquirers. But under no circumstances is a person who requests guidance required to accept the Government's advice regarding disclosure of unclassified information. Each individual possessing knowledge or information is the final judge of how best to serve the public interest.

It will not be possible to provide instantaneous service, but all inquiries will be answered promptly within the limitations imposed by problems of fact and judgment.

Whom the Program Serves

Representatives of private enterprises and other organizations, State and local officials, and private individuals are invited to utilize the OTS service in protecting unclassified technical information.

Regular Contacts

Nothing in this program is meant to stop industrialists and others who have regular contacts in the Government from using their usual channels when questions of security and the public interest arise. The Department of Commerce service, rather, makes it possible for persons who do not have direct contacts to obtain expert guidance from the Government on matters involving strategic technical information.

Scientific and Technical Journals

It is not contemplated that persons in a position to release unclassified technical information will normally call on OTS for guidance regarding release to known representatives of recognized scientific and technical journals, radio networks, press associations, and newspapers. Most of these organizations have wide experience in safeguarding such material. However, the service will be available to both the editor and the source of the material if they desire to use it.

Export of Technical Data

The program of voluntary protection centering in OTS is concerned with information for release within the United States, which amounts to publication to the world. A separate service for the guidance of persons transmitting unclassified technical information directly to other countries is provided by the Office of International Trade of the Department of Commerce.

A special unit of OIT clears inquiries on the security implications of exporting unclassified technical data on *advanced* developments, technology, and "know-how"; on prototypes of such developments; on special installations; and on arms, ammunitions, and instruments of war which do not have security classifications.

INDICATOR DYES FOR SHORT STOP BATHS

CARLOS JULIO RISSO-DOMINGUEZ*

DIFFERENT MANUFACTURERS of prepared photographic chemicals introduced a new constituent in short stop baths some time ago. This is *indicator dyes* which change the color of the entire bath to show when this acid solution is exhausted. Despite the fact that pH indicator dyes are rather well known to the chemist, photographic formulas containing them have not been widely published. Formulas using indicator dyes have not, of course, been fully discussed in the photographic literature. Up to this time photographic people only know that this or that manufacturer supplies a certain short stop bath that changes its color with the exhaustion of the acid.

It is obvious how important it is for amateurs in their darkrooms as well as for professionals in their photographic or motion picture processing laboratories to control the life of the short stop bath.

A pH meter is beyond the possibilities of most photographic workers and its use will not be logical as pH indicator dyes offer such great advantages and facilities which could not be expected from any other feasible method. These dyes yield results of great accuracy which are not even required from the photographic point of view. The convenience and economy which these give us are only two of their qualities which cannot be overlooked and which make them useful in the photographic laboratory. The color change of the solution, or of the drops which fall in the bath, or of strips of paper immersed in the baths, etc., being evident under the safelights, provides the surest way of knowing that the short stop bath should be discarded.

Indicator Dyes for Photographic Use

The modification in the structure of pH indicator dyes and the corresponding change of color takes place within a limited pH range, and is many times shown by shades in between those colors that are formed at both ends of the pH range. A great many pH indicator dyes are known, and also many of them have been placed on the market by manufacturers of laboratory chemicals. These cover a great variety of pH ranges. A dye should be selected having a noticeable change of color in a pH range that corresponds to the variation in acidity of the short stop bath which we want to know. According to this we should seek those having a pH range ending in a value of approximately 5. Many indicators fulfill this requirement. We can also select a Universal indicator consisting of a solution with several dyes that is able to show, by passing through many colors, a complete pH range. Highly pure products are not essential for the use we intend to give them. There are two dyes of low cost and supplied in a degree of purity that makes them advisable for use as indicators for acid short stop baths, with a very interesting pH range that suits our object. We refer to the Sodium tetra-azo-diphenylnaphtionate or Congo Red with a pH range of 3.0 to 5.0 and to the Sodium alizarinsulfonate or Alizarin Red S, with a pH range of 3.7 to 5.2 (yellow to pink). The color change of the Congo Red with the specified pH range is from blue (acid) to red (very low acidity or alkaline). This indicator is well known and largely used, especially as test papers.

The Sodium alizarinsulfonate is an interesting indicator which will assist us in those cases when Congo Red has no utility, being used in prepared short stop baths that have been marketed by some manufacturers. Its change of color is from yellow (acid) to pink (low acidity), ending finally to violet (alkaline). These are the best indicators to test short stop baths. Both help us in accordance with the way the tests are made, as we will see later on. These two dyes are very soluble in water, and concentrated aqueous solutions can be prepared for use as stock solutions that enable us to make any kind of tests according to the different needs, e. g. to use directly in the baths, as drops testing the solution in test tubes, or for making test papers. They also have very low staining properties on films or papers. The use of them results in a great economy, even in those cases when used on a very liberal basis. This is due mainly to the low cost of these dyes.

The formulation with these dyes is simple. We suggest the following formulas:

INDICATOR FORMULA CJRD #I-1

Water	400.0 cc
10% aqueous solution of Dibutyl phenylphenol sodium disulfonate*	100.0 cc
Congo Red	4.0 g
Borax	0.5 g

This formula is specially designed to prepare test papers. Congo Red test papers are paper strips impregnated in a solution of this dye, such as the mentioned formula, which, being introduced in aqueous solutions with different values of pH, show the same color change as the dye itself. This is a very easy method, but not as rapid as the drop method using formulaes I-2 and I-4. Strips of Congo Red paper are made by introducing sheets of paper in a solution of the mentioned dye, and once that they have been adequately dried they are then cut to the desired sizes. To make, a very good quality of paper, such as filter paper, is not necessary for photographic use in common practice. This formula is only for photographic use.

A test strip immersed in the stop bath becomes a bluish-violet color if the acid bath is found with a pH value corresponding to its highest degree of acidity. The strip which due to its blue color seems to be almost black under the red lamp will become paler and will disappear from

* Buenos Aires, Argentina (Azcuenaga 1872). Received 30 October, 1950.

* This compound is a wetting agent available from Monsanto Chemical Co., under the trade name "Aresklene 400".

our sight when the bath is exhausted. When introducing the paper in the bath, if the change from red to blue is not so rapid as in the case with a fresh solution, the bath has a very poor activity. If the change is very slow or does not occur, the bath should be discarded.

It is possible to use this formula and simple solutions of Congo Red in water to test short stop baths by adding drops to the bath and seeing the change of color. But the drops have a greater specific gravity than water and short stop baths. Also they have a very slight diffusion value. They fall to the bottom of the trays, tanks, etc., and they expand forming ring figures. They may stain prints in this concentrated form, and also in some cases it is necessary to agitate the bath or test tube to know exactly the color change. We overcome this difficulty by changing the physical properties of the solution. When a more rapid testing is needed, we suggest the following formula where the 1-methoxy-2-propanol modifies the physical characteristics of the drops, producing a strong diffusion of the dye in the water surface and an instantaneous change of color.

INDICATOR FORMULA CJRD #I-2

1-Methoxy-2-propanol*	410 cc
Water	90 cc
Congo Red	1 g

*The propylene glycol methyl ether is available from The Dow Chemical Company under the trade name of "Dowanol 33B".

It is necessary in this case to release the drops very near to the water surface. When the drops touch the bath surface, blue arborescent figures are instantly formed due to this diffusion in the surface. If the solution is exhausted, no noticeable change exists under red safelight. Truly the most safe and neat method to test short stop baths is to use formula I-2. However the Congo Red formulas have one disadvantage; it is only possible to test the baths under yellow, orange and red safelights, but not under green safelights.

A formula suggested for using the indicator dye permanently in the short stop bath and also in some cases to add as drops*, is as follows:

INDICATOR FORMULA CJRD #I-3

Water	300 cc
1-Methoxy-2-propanol	200 cc
Sodium alizarinsulfonate	5 g

To know the quantity of the stock solution that it is necessary to add in trays, tanks, etc., the worker should always test the amount of dye he plans to use under the darkroom conditions he will use to make sure that it does show up when the change takes place or in order that the color is noticeable under the safelight and with his laboratory conditions. To do this, the tray where the short stop bath is used should be filled with water rendered weakly alkaline with a small amount of sodium carbonate and, reproducing the same conditions, the necessary drops should be added until a darkening of the solution is noticed. This should be done with some agitation in order to insure that the dye is thoroughly diffused in all the bath.

A formula for instantaneous testing of short stop baths as in the case of formula I-2 but with Sodium alizarinsulfonate, is as follows:

INDICATOR FORMULA CJRD #I-4

Water	500 cc
Sodium alizarinsulfonate	0.5 g
Diethanolamine	4 cc

With this formula for speedily testing the pH of the bath as in the case of formula I-2 it is necessary to follow a certain technique. From the dropping pipette it is necessary to release the drops at a distance of 1 meter from the bath surface. If the dark violet color of the drops does not disappear instantly when they touch the surface of the bath, the short stop bath should be discarded.

For several reasons each of these formulas and dyes is useful for different purposes. If we should be asked which of these is the most helpful for common photographic laboratory use, we should not be able to give a definite answer of a universal character. The suitableness in practical use of each of these formulas depends on the purpose for which it is required, and in order to find out which should be selected, we have to check the advantages of each.

Color Change and Safelights

First of all, it should be borne in mind that while one has a darker color with an acid pH and Congo Red, the other dye, Sodium alizarinsulfonate, has in this case a clear yellow color. Inversely with a neutral or alkaline pH, Congo Red has a clear color and Sodium alizarinsulfonate a dark color. For the Congo Red, this is only true under yellow, orange and red safelights but not under green safelights. Formula I-2 and the Congo Red papers do not have any value in this case. Under green safelight the red color will be very dark, and the color change will be imperceptible. The change from yellow to violet of Sodium alizarinsulfonate is noticeable under all safelights, but it is necessary to remember that this dye has a great number of transition shades. From yellow it turns to yellowish-amber, from this to amber, from this to reddish-amber, from this to pink, from this to purplish-pink, from this to purple, and from this to purplish-violet. These changes of color show corresponding changes of pH over a wide range. For our interest, we need mainly to know the first change from yellow to pink, and this change is not well noticeable under red safelight. To overcome this disadvantage we have developed formula I-4 for using under all safelights. Following the above mentioned instructions, it is possible to test short stop baths with Sodium alizarinsulfonate as speedily as in the case of formula I-2. Here if the bath has some acidity, the color will change from violet to yellow. If not, the violet color will remain unchanged, and this is a safer method than to use formulas of Sodium alizarinsulfonate with changes from yellow to pink.

Advantages and Disadvantages

To determine which is the most suitable method and dye in connection with each use, it is necessary to consider the three main ways to test short stop baths, which can be con-

* Using this formula by the drop addition method, it is necessary to modify the amounts as follows: Water 200 cc, Sodium alizarinsulfonate 0.5 g, and 1-Methoxy-2-propanol 300 cc. This is formula CJRD #1-3A.

sidered: (1) the dye is in the short stop bath permanently, (2) the dye is added in form of drops and (3) the dye stains a paper. In the first case it is only possible to use Sodium alizarinsulfonate, as using Congo Red permanently in the bath would prohibit viewing the prints due to the bluish color which seen under a red light is very dark. This dye is included following this method in some short stop baths with indicator that were marketed some time ago. The main disadvantage of this procedure is that the dye can stain the prints in some cases with a pink or violet color. As it does not compete with formulas I-2 and I-4, this way is suggested only for some cases of amateur use.

In the second case, the drop method, we have the most speedy and safe way of testing short stop baths, and we suggest following this in all cases of amateur, professional or motion picture use. Practically, formulas I-2 and I-4 have no disadvantages. However if the drops fall accidentally on papers or films, they can stain those photographic materials. The method using the drop procedure and testing the sample in another container has no disadvantages and we suggest this as the most safe, especially for motion picture and professional use. In the third case, only Congo Red is a suitable dye for making test papers. Using Congo Red paper strips, no possibility exists that the dye can stain prints or films. A very good way of determining the exhaustion of short stop baths is provided without the slightest risk. Unfortunately it is not as speedy as the drop methods using formulas I-2 and I-4. Test strips can also be placed in bottles storing the baths, and in this form guarantees us that, while it keeps its bluish-violet color, the bath can be used.

ACKNOWLEDGMENT

Acknowledgment is made to The Dow Chemical Company and to Monsanto Chemical Company for supplying kindly the mentioned chemicals of these companies to conduct the tests for developing these formulas.

The Qualitative Determination of Metallic (Cationic) and Anionic Constituents of Photographic Scums and Sludges*

By R. W. Henn

SUMMARY

Scums on films and prints can often be identified by their appearance and solubility but specific confirmatory tests are desirable to determine the metals and anions present. Spot tests are the most readily applicable and may be performed on the film, or the scum may be dissolved and the reaction carried out on a "spot" plate. Aluminum is detected by (a) its amphoteric solubility, and (b) with alizarin or morin reagents; calcium with alizarin, oxalate, or picrolonic acid; chromium with diphenyl carbazide following oxidation; iron by ferrocyanide or thiocyanate; and silver with dimethylamino benzal rhodanine. Sulfite is detected by its bleaching action on diphenyl methane dyes, phosphate, by the molybdate reaction.

CONSIDERING the widespread occurrence of scums and sludges in the photographic process, particularly in systems subjected to extensive use, the literature on them is rather meager and almost the only substantial material is to be found in a number of papers by Crabtree and his co-workers. The paper "Scums, Sludges, and Stains," by Crabtree and Henn,[1] includes a general summation of the scums appearing during processing, together with their causes and removal, and some tests to aid identification, while the problem is treated more comprehensively in the booklet "Stains on Negatives and Prints."[2] Since the appearance of this article, a number of specific tests have been worked out and applied to the determination of the nature of numerous scums and sludges. From the viewpoint of the photographer, these tests may be complicated and involve substances well out of his usual experience, but most of the tests are reasonably direct analytical procedures and should offer no difficulty to the trained chemist if he familiarizes himself with the procedures and, in case of doubt or infrequent use, runs both a blank and a solution containing the ion in question, as controls.

Supplemented by a knowledge of the photographic process involved, of the general causes of scum formation, and by the information given by the appearance and solubility of the scum, these tests will aid materially in determining cause and prevention.

A. Analytical Techniques

The quantity of material involved in producing a thin, but visible, film on the surface of a photographic material is very slight, and sensitive tests must be employed to produce equally visible reactions with this meager material. Colorimetric procedures are often of high sensitivity, and may be applied as spot tests, where the reaction is carried out in the volume of a few drops. Numerous tests and techniques are described by Feigl,[3] but not all of these are applicable to scum analysis.

When determining the nature of a sludge, the usual qualitative techniques for reactions in solution are often applicable and the reaction may be carried out in test tubes, adapting the size to fit the material available.

* Communication No. 1379 from the Kodak Research Laboratories. Received 8 December 1950.

If the quantity of sludge is very small, spot reactions are again pertinent, and it is usually most convenient to place a drop containing the sludge on a glass plate under a low-power microscope to observe the reactions. The material may be washed by centrifuging, and a small laboratory model holding 15 ml. centrifuge tubes will be found a useful tool in this type of analytical work.

Three general techniques are applicable to the scum analysis: (1) the reagents are spotted directly on the film, (2) the scum is dissolved in the reagent and transferred to the spot plate, and (3) clippings of the film are immersed in solutions of the reagents. The technique used will depend upon the necessity for preserving the image and upon the nature of the deposit.

(1) Spotting the reagent directly on the film has the advantage that the maximum quantity of reactant is present. Difficulty may be encountered with the propensity of reagents in solvents or alkalies to wet the gelatin and run over the surface, while the presence of an image will interfere with the observation of some reactions. The chance of damage to the image is, of course, great and the spotting should be confined to a waste film or to waste areas.

(2) Dissolving the scum and carrying out the reaction elsewhere is generally preferable. Most scums are soluble either in acid or alkali. Two drops of the solvent are placed on the film, smeared around to dissolve as much of the scum as possible, and a drop of the resulting solution is transferred to a spot plate or a piece of glass. The glass is often preferable because it is possible to see most of the reactions clearly under a lower-power miscroscope (20X magnification) by transmitted light. If the reagents wet the plate and spread, this procedure is not possible. Other reactions are best observed by reflected light. In some cases, small test tubes are conveniently used for carrying out the reaction even when only a few drops of reagent are employed.

(3) The third technique is to clip a margin of the film bearing the scum or an unimportant picture area from the film and either spot this, or bathe it in the reagents in question. This technique is preferred where the photographic material bearing the scum is of value, as is frequently the case. The whole problem of determining the nature of a scum upon such a film is delicate, and permission should be obtained from the owner before cutting or spotting the film. It is advisable to make a photographic copy before undertaking work on a valuable negative.

B. Metal Constituents

1. Calcium

Occurrence: Calcium is precipitated in the developer where it may form a sludge, a scale on the tank walls, or adhere to the film as a scum. Depending on the ions present and the conditions of formation, it may be precipitated as the sulfite, carbonate, borate, or phosphate and may be a double salt such as $CaCO_3.Na_2CO_3.2H_2O$ or $CaO.3B_2O.12H_2O$.

Appearance: The scum has a white chalky appearance which may follow fingerprints or other areas where resistance to free diffusion has been met. The sludges and tank scales may be light gray to brown and black, depending on the presence of silver, oxidation products of the developer, or iron. The sludges and scales may be either compact or flocculent.

Solubility: The freshly formed scum is soluble in 10% acetic acid. On aging, the solubility decreases and older deposits may require 10% hydrochloric acid for solution, while it may be necessary to heat the acid to dissolve the scales completely. Calcium precipitates are insoluble in alkalies.

Chemical Tests: (a) *Oxalate.* The oxalate test is very reliable and sensitive, and may be applied to quantitative measurement. It is most adaptable to sludges and scales, where the washed precipitate is dissolved in 10% hydrochloric acid, neutralized with ammonia, heated and a 4% solution of sodium oxalate added. White crystals of calcium oxalate form slowly. The test is best carried out quantitatively* by adjusting the pH to the methyl red end-point with acetic acid and ammonia, heating, and slowly adding the oxalate. The precipitate is filtered, washed with a very dilute weakly acid oxalate solution, finally with water, dissolved in 10% sulfuric acid, and titrated hot with permanganate.

The oxalate test is applied to scums, by dissolving as much as possible in 2 drops of dilute hydrochloric acid, transferring 1 drop of this to a glass plate, and adding 2 drops of the ammonium hydroxide and 1 drop of oxalate.

(b) *Picrolonic Acid.* Calcium forms an insoluble, yellow, picrolonate salt which is applicable to scum determination. The scum is treated with 2 drops of 10% acetic acid; 1 drop of this is transferred to a glass plate, and 1 drop of the picrolonate solution is added. Yellow crystals of calcium picrolonate may be observed under low-power magnification.

It is necessary to run a blank with the reagent and acetic acid alone, because the reagent may crystallize under some conditions. The reagent cannot be further diluted, however, without decreasing the sensitivity of the test. Very large quantities of magnesium interfere, preventing precipitation and difficulty is encountered if hydrochloric acid has been used to dissolve the precipitate, even if this has been neutralized. Aluminum does not interfere.

(c) *Alizarin S.* The scum is dissolved with 2 drops of 10% hydrochloric acid, and 1 drop of this solution is transferred to a glass plate. Then 2 drops of 10% ammonia and 1 drop of Alizarin S solution are added. In the presence of calcium, a blue color appears, while crystals are visible under a low-power (20X) microscope. In the absence of calcium, the solution remains a clear red-purple. Aluminum does not interfere. This test has been adapted from that given by Snell,[4] by substituting Alizarin S for alizarin, since the alizarin sulfonate is also applicable to the determination of aluminum.

Reagents:

Ammonium oxalate, 4%.
Hydrochloric acid, 1:9.
Ammonium hydroxide, 1:9.
Methyl red, 0.2% in alcohol, or indicator paper appropriate to adjust pH to about 5.5.
Picrolonic acid, 0.26%. The picrolonic acid is dissolved in hot water, chilled to 40 F, and filtered. Refiltering may be necessary after standing.
Acetic acid, 1:9.
Alizarin S, sodium alizarin sulfonate, 0.1% in water.

* Mr. Henn has made a considerable number of quantitative determinations of the calcium in sludges and scales and has obtained information of benefit to him, hence this allusion in an otherwise qualitative paper. K. G., Ed.

References: The oxalate tests have been adapted from procedures given by Scott[5] (Vol. 1, p. 206), the picrolonic acid test and the alizarin test, from Snell[4] (pp. 465-466).

2. Aluminum

Occurrence: Aluminum is precipitated in the fixing bath and in the wash tank as the sulfite, phosphate, or hydroxide by interaction of the alum of the fixing bath with developer ingredients, or by hydrolysis in the wash water. It may occur as a sludge or as a scum.

Appearance: Except for the rare presence of foreign coloring matter, aluminum precipitates are essentially white. The sludges are uniformly flocculent, while the sulfite (or possibly phosphate) scum formed in the fixing bath may vary from a thin layer to a dense, white powdery deposit. Scum picked up in the wash water is in the form of discrete particles coagulated by organic matter, such as bacterial masses, and may be tan or brownish.

Solubility: Aluminum precipitates are characterized by solubility in both acids and alkalies. Scums may be appreciably soluble in reagents as weak as dilute acetic acid and ammonia, but hydrochloric acid or sodium hydroxide may be necessary to effect complete solution. Where organic material is also present, the residual skeleton of this will be noted on careful observation.

Chemical Tests: (a) *Solubility.* The amphoteric nature of the aluminum precipitates is probably the greatest aid to their identification. A scum is best spotted with sodium and ammonium hydroxides, hydrochloric and acetic acids. After standing about 2 minutes, the drops are washed off, the film is dried, and observed. Partial solubility will be noted in the weak reagents, more complete in the stronger. It is necessary to salt the sodium hydroxide solution with sodium sulfate in order to prevent the solution of the emulsion itself. Like all spot tests, much care must be exercised to avoid picture areas if the film is of value and, in this case, the tests are conducted with film clippings partially immersed in the reagent.

(b) *Morin.* The precipitate is dissolved in the sodium hydroxide solution and transferred to a spot plate. Then 1 drop of morin solution and 1 drop of glacial acetic acid are added. On the addition of the acetic acid, the brown hue changes to a yellow-green in the presence of aluminum. This lake of morin and aluminum is strongly fluorescent and glows brilliantly under an ultraviolet lamp. Holding a cobalt glass or a Kodak Wratten No. 35 Filter between the sample and sunlight is also effective in showing the fluorescence.

The test is extremely sensitive and will react to the aluminum retained by the film fixed in an alum fixing bath, regardless of scum. Where the scum follows a definite pattern, the aluminum may be detected by bathing a film clipping in the dilute acetic acid, then the morin, and observing the greater fluorescence along the pattern. It is very applicable to sludges, and the paper on which the sludge is filtered may be effectively spotted.

The test is not affected by calcium or chromium, and the acidity is not very critical.

(c) *Alizarin S.* This test is carried out very similarly to the morin test, by dissolving the precipitate in the sodium hydroxide, adding the alizarin, and then acidifying with glacial acetic acid. The purple color of the alkaline solution is replaced by a red color when acidified and, in the presence of the aluminum, a precipitate of the red alizarin lake.

Neither calcium nor chromium interferes with this test. The precipitate shows weak fluorescence. The test appears to be very positive, but is subject to the same objection as the morin test, namely, that the aluminum retained in the gelatin, independent of the scum, is adequate to produce a positive response.

Reagents:

Hydrochloric acid, 1:9.
Acetic acid, 1:9.
Acetic acid, glacial.
Ammonium hydroxide, 1:9.
Sodium hydroxide, 10 parts plus sodium sulfate 10 parts, water to 100.
Morin, 0.5% in alcohol.
Alizarin S, sodium alizarin sulfonate, 0.1% in water.

References: Morin test—Feigl,[3] page 113. Alizarin test—Feigl,[3] pp. 114-115; Snell,[4] pp. 259-260.

3. Chromium

Occurrence: As the sulfite, or possibly the hydroxide, formed in chrome alum stop baths and fixing baths as a scum or sludge.

Appearance: Light blue-green. Hue may be too light to form basis of identification.

Solubility: Soluble in dilute hydrochloric acid, less completely in sodium hydroxide.

Chemical Test: The following chemical test is indirect but very positive and is capable of detecting low concentrations of chromium. The scum or sludge is dissolved in dilute hydrochloric acid. A drop of this solution is transferred to a spot plate and the following reagents are added successively: bromine water; sodium hydroxide until the solution is alkaline; phenol, diphenyl carbazide; and sulfuric acid. The red color of the reagent changes to an intense blue-violet on acidification if chromium is present. Aluminum does not interfere. In this procedure, the chromium is oxidized to chromate by the bromine; excess bromine is taken up by the phenol. The chromate reacts with the diphenyl carbazide in acid solution to yield the blue-violet color.

Reagents:

Hydrochloric acid, 1:9.
Diphenyl carbazide, 1% in alcohol.
Bromine water, saturated.
Sodium hydroxide, 10%.
Sulfuric acid, 2N, about 3%.
Phenol, a 50% solution, or a small crystal of the solid.

Reference: Feigl,[3] pp. 98-99.

4. Iron

Occurrence: Iron is present in small quantities in numerous sludges and some scums. Rust spots of the hydrated oxide may be formed at any time in the processing procedure, including drying. Iron stains may be formed from toners and reducers, possibly as the blue ferri- or ferrocyanides. Iron may form coloring matter in various sludges, especially in those of biological origin.

Appearance: Iron spots, due to rust, etc., are usually a clear yellow to brown and free from the dichroism of similar silver spots.

Solubility: The iron spots will be dissolved or reduced by an oxalate solution acidified with hydrochloric acid. The blue intensifier stains are alkali-soluble.

Chemical Tests: (a) *Oxalate Bleaching.* The iron spots may be dissolved by treatment with a solution containing 5 parts of potassium oxalate and 5 parts of concentrated hydrochloric acid per 100.

(b) *Prussian Blue.* The spot is acidified with dilute hydrochloric acid and treated *in situ* with potassium ferrocyanide. The characteristic Prussian Blue hue is formed immediately, even when the iron concentration is very low.

(c) *Thiocyanate.* The spot is treated with dilute nitric acid and a drop of thiocyanate solution added. The appearance of the bright red of ferric thiocyanate serves for identification.

Iron is a relatively easy element to detect even in small quantities. In fact, detection of the presence of iron may not disclose the true character of the scum, since the iron may be merely coloring matter in a scum which is basically organic matter, calcium, etc.

Reagents:

Hydrochloric acid, 1:9.
Nitric acid, 1:9.
Hydrochloric acid, 5 parts plus potassium oxalate, 5 parts plus water to 100.
Potassium ferrocyanide, 1%.
Potassium thiocyanate, 1%.

5. Silver

Occurrence: An ion as common as this in the photographic process not infrequently forms a sludge, or scum, or stains the film. Silver stains are very often yellow to brown by transmitted light, but they are usually dichroic, with mirror-like qualities which serve to differentiate them from iron stains. Like iron, silver is frequently a coloring substance for organic scums.

Solubility: Silver dissolves slowly in sodium or potassium cyanide. It is much more rapidly dissolved by a mixture of ferricyanide and hypo. It is also dissolved by dilute nitric acid.

Chemical Tests: (1) *Chloride.* Silver in sludges may be detected by the usual qualitative procedure where the precipitate is dissolved in dilute nitric acid, and dilute hydrochloric acid is added. The white precipitate of silver chloride may be confirmed by dissolving it in ammonia, or it may be reduced to black silver by adding a photographic developer in sufficient excess to reach an alkaline condition.

(2) *Dimethylamino Benzal Rhodanine.* This is a sensitive reagent and will detect small quantities of silver as in a dichroic stain. The stain is first treated with a 2% potassium cyanide solution for about 2 minutes. A drop of this solution is transferred to a spot plate and a drop of the rhodanine reagent is added. It is then acidified with 1 drop of nitric acid. A red-purple precipitate of the silver dimethylamino benzal rhodanine is formed. The test is more sensitive if carried out on the film. The dilute nitric acid is a less active solvent than the cyanide but should produce a test if the reaction is carried out directly on the film.

Mercury and gold will not interfere in the presence of the cyanide and, although cuprous ions will react, they are very unlikely to be present. The silver of the image will, of course, also react if given sufficient time. However, dichroic silver stains dissolve more rapidly; and if it is possible to spot both a stained and unstained area, a much stronger test will be obtained in the stained area if the stain is due to silver.

Reagents:

Nitric acid, 1:9.
Potassium cyanide, 2% (poison).
Dimethylamino benzal rhodanine, 0.2% in acetone.

Reference: Feigl,[3] pp. 16-19.

C. Anions

The detection of anions is of importance in ascertaining the cause of scums and sludges. Thus, establishing that a precipitate is calcium or aluminum phosphate rather than sulfite, will serve to indicate the presence of a phosphate, and possibly the breakdown of the polyphosphate sequestering agent used in many developers. In the case of aluminum precipitates, the sulfite is usually formed in the fixing bath while the hydroxide is formed in the wash water.

1. Sulfite

Occurrence: Sulfite is a common ion for calcium, aluminum, and chromium precipitates. The appearance and solubility are discussed under the various cations involved.

Chemical Test: The test for sulfite is based on the ability of this ion to bleach certain triphenylmethane dyes, such as Malachite Green or Basic Fuchsine, in weakly acid solution. The scum is dissolved in 2 drops of dilute hydrochloric acid, and spreading these over the surface to dissolve the maximum quantity possible increases the sensitivity. Then 1 drop of this solution is transferred to a spot plate, neutralized by the addition of 2 drops of sodium bicarbonate, and the lightly colored dye added drop by drop, with stirring after each addition. The sulfite present will bleach the dye, the number of drops bleached being proportional to the sulfite concentration.

This test is informative in that bleaching of the dye is a good indication of the presence of sulfite, but if the sulfite scum is quite thin, the bleaching of the dye may be too weak to detect. It is necessary to work with careful controls, a blank of the reagent, and a sample to which a drop of 0.2% sodium sulfite has been added.

Hypo, even in large quantities, does not bleach the dyes. Difficulty has been encountered in bleaching aged dye solutions, and these should be prepared fresh. The test will not work in strongly acid or alkaline solution.

Where an appreciable quantity of sulfite is present, as in a sludge or scale, the decolorization of iodine in acid solution may be used as an indication of the presence of sulfite. Thiosulfates will, of course, also reduce iodine.

Reagents:

Hydrochloric acid, 1:9.
Sodium bicarbonate, 10%.
A lightly colored solution of Malachite Green or Basic Fuchsine, prepared immediately before use by adding a few very small crystals to a few cc. of water.

Reference: Feigl,[3] page 201.

2. Phosphate

Occurrence: Calcium and aluminum phosphates may be formed if an orthophosphate is present in the developer, due to the addition of the phosphate as an alkali, or to the breakdown of polyphosphate sequestering agents.

Chemical Tests: The conventional molybdate test is applicable to the detection of phosphate in scums, even where the deposit is very light. If the destruction of the silver image is of no importance, the acid reagent may be added directly to the scum. In the presence of phosphate, a yellow precipitate will form inside the drop. If the attack of the reagent on the silver image is objectionable, the scum may be dissolved in dilute hydrochloric acid and transferred to the spot plate before the reagent is added.

The silver dissolved from the image does not interfere, nor does aluminum, calcium, or sulfite. In the presence of excess acid, molybdenum trioxide may be formed. This is much lighter in hue than the phosphate precipitate.

Reagent: A satisfactory molybdate reagent is that given by Lange[6] which is prepared by dissolving 72 grams of molybdenum trioxide in 75 cc. of concentrated ammonium hydroxide and 130 cc. of water; this mixture is then poured into a solution of 240 cc. of nitric acid and 500 cc. of water.

D. Discussion

The chief reason for the analysis of scums and sludges is to prevent their recurrence. The work is greatly aided if the analyst is familiar with the tests and their limitations and with the photographic process and the most probable causes of sludge or scum formation. Familiarity with the tests may be obtained by trying them out first on a known solution before undertaking the actual analysis of the scum or sludge. For spot tests, a 0.2% solution of a salt of the ion in question (about 0.01 molar) is suitable for control purposes, 1 drop of this giving a reaction of the order of that obtained from the solution used to dissolve a small area of a moderately dense scum. A blank without the ion is also essential.

The conditions causing the formation of various scums are discussed in references (1) and (2). These conditions include an inadequately acid stop bath, insufficient agitation, use of exhausted solutions, and lack of cleanliness. Information which may be of value includes the nature and condition of the developer, stop bath, and fixer, the washing process, and wetting agents or other drying baths employed. Knowledge of the stage at which the scum occurs is invaluable. Analytical procedures will naturally be modified if phosphates are known to be present or if chrome alum stop baths or fixers have been used, as these are potential sources of scum, but they may be entirely innocent in the case at hand. If proprietary chemicals —packaged developers and fixers—are employed, the nature of the solutions is of course uncertain, but the chance of incorrect compounding is reduced.

The reagents employed are listed under the various analytical procedures. They may be obtained from chemical supply houses, while the special organic reagents are obtainable from the Eastman Organic Chemicals Department, of the Eastman Kodak Co., Rochester 4, N. Y. The reagents are most conveniently stored in 1 oz. dropper bottles, to be ready for use. The other equipment needed is fairly simple and much of it has been mentioned under the paragraph on technique. It includes a generous supply of small pipettes or medicine droppers, a white spot plate, small glass plates, filter paper, small test tubes, and a wash bottle, while a low-power microscope and a small laboratory centrifuge are desirable. Additional refinements may be obtained with micropipettes and special microequipment.

An analytical procedure for the examination of a scum is given in the following table. It is to be supplemented by a knowledge of the process employed and of the possible sources of the scum. It is not comprehensive, but includes those ions described in the body of this paper (which are the most common ones encountered in scums) and furnishes the preliminary information needed for the application of the appropriate specific test.

E. Outline: An Analytical Procedure for Scums

1. Physical Form

(a) Continuous—formed by chemical interaction in the solution.
(b) Broken patterns—picked up from the surface or formed as immersed (before wet).
(c) Spots and discrete patches—picked up from the solution.

2. White or Light-Colored Scums

(a) Soluble in hydrochloric acid but not in sodium hydroxide. Check for calcium.
(b) Soluble in both hydrochloric acid and sodium hydroxide. Check for aluminum, and for chromium, if chrome alum is employed in the process.
(c) Water-soluble. May be crystallized hypo, residues from hard water, or wetting agents.
(d) Insoluble in above reagents. Probably organic matter, especially if discrete patches. May also be sulfur or oily deposits.
(e) Anions. If phosphate is present in the system, apply sulfite and phosphate tests.

3. Yellow and Brown Stains

(a) Soluble in acid oxalate. Test for iron.
(b) Soluble in ferricyanide-hypo. Test for silver.
(c) Observe for colorless residues. May be organic matter, calcium, aluminum, etc.

4. Reagents for Solubility Tests

Hydrochloric acid, 1:9 (1 part concentrated acid + 9 parts water).

Sodium hydroxide plus sodium sulfate, 10 parts each per 100.

Potassium oxalate plus hydrochloric acid, 5 parts each per 100.

Potassium ferricyanide plus sodium thiosulfate. Mix equal parts of 2% potassium ferricyanide and 10% sodium thiosulfate immediately before use.

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